PRINCE BOOK HOUSE
PESHAWAR

RADIANT NOTES

FCPS PEARLS

FOR FCPS-1 ALL SPECIALTIES

14TH EDITION
YEAR 2025

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HELPING HANDS:
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GOLDEN FILE POINTS:
400+ past papers with relevant theory.

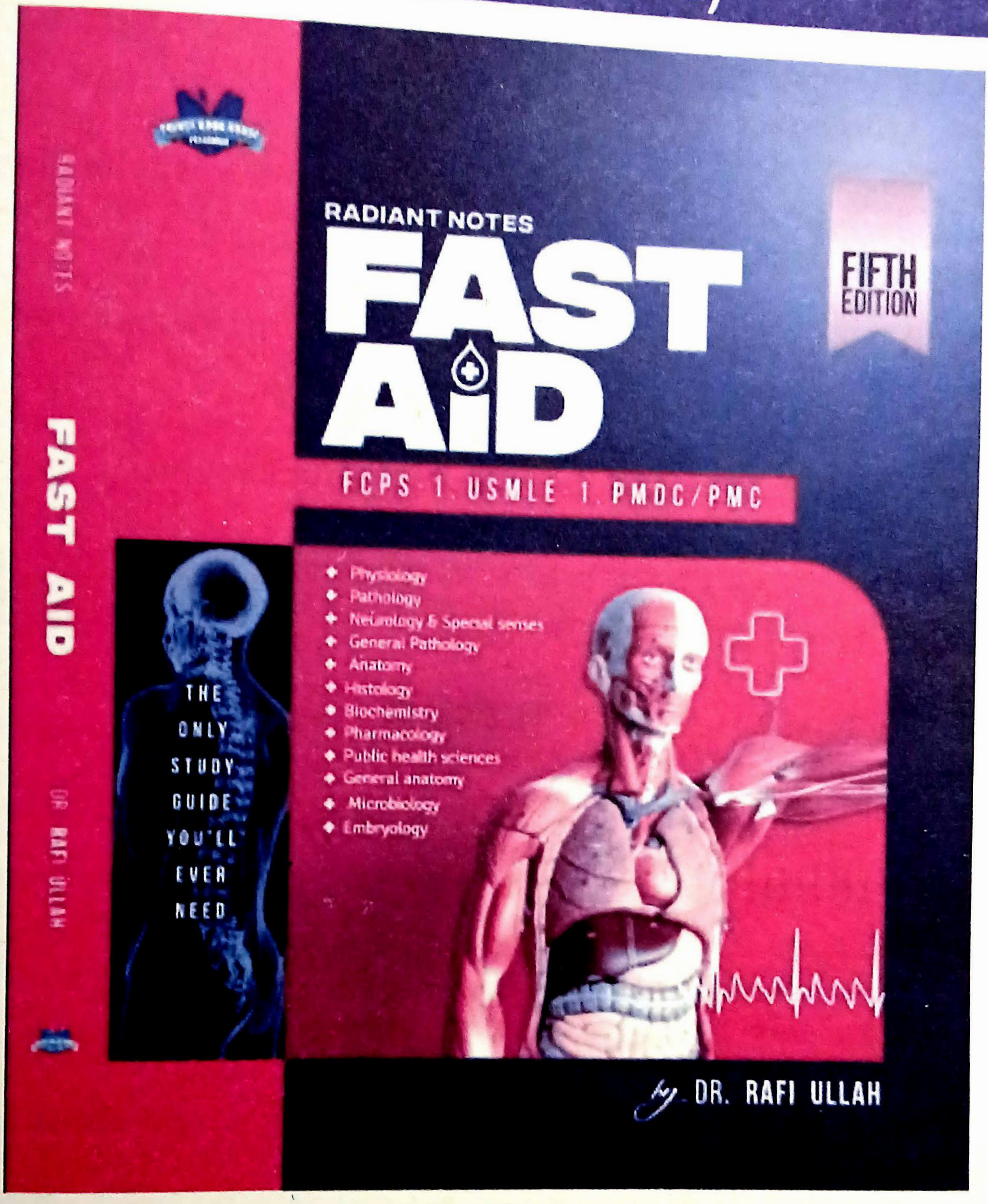
PLATINUM FILE 1:
Feb-May 2024 new questions extracted.

PLATINUM FILE 2:
Aug-Nov 2024 new questions extracted.

Covers all MCQs from 2015 to date in a single volume. No repeated MCQs — save time and money with efficient, streamlined preparation.

HIGHLY RECOMMENDED AND TOP SELLING BOOK FROM LAST 4 YEARS

RECOMMENDED BOOK
(INSIDERS ADVICE)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FAST AID
FIFTH EDITION
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Physiology
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Histology
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THE ONLY STUDY GUIDE YOU'LL EVER NEED
by DR. RAFI ULLAH
RADIANT NOTES
FAST AID
DR RAFI ULLAH

- Fast aid is written with extensive care to meet the new challenges of changing exam patterns and questions.
- All subjects "physiology, pathology, anatomy, general anatomy, histology, embryology, microbiology, immunology, biochemistry and others" compiled into one simple book
- All the previous MCQs are highlighted red
- Given in easy table format, so it could be memorized easily
- Flow charts and mnemonics for easy and quick revision

ABOUT FCPS EXAM

- Don't forget to take your admit card
- Your seating arrangement and laptop number will be displayed on a paper on a wall
- After finding your seat, your roll number and name would be pasted there, along with username and password.
- Put that username and password and click login
- Instructions would come after logging in. read it, in the end there would be a small option for start
- Start when you are asked to, exactly on your time.
- 2 papers, each of 100 BCQS.
- Total 100 questions, for each question there would be 5 options, choose the most appropriate.
- If you are sure about the answer, click it.
- If you don't know the answer, skip it and it would come in the end, but you can only skip it once
- Timer would be running in the top right corner of your laptop screen
- No mobile phones even not a pencil is allowed inside examination hall
- Tea and launch would be offered in breaks, do have it.
- Best of luck

FCPS PREPARATION PLAN
FOR ALL SPECIALTIES (3 MONTHS)

- This is the best method to cover your whole MCQs and theory within 2 months. You can make changes as per your routine and liking.

- Theory should be done from Radiant notes-fast aid book, which is an excellent compilation of all the theory from books such as BRS physiology, BRS pathology, First aid, pathoma, short Snell, high yield and many other books. Moreover, all the Mcqs that have come in previous papers so far are written in red and highlighted for easy and quick revisions and understandings.

- For MCQs only this one book is more than enough, it's the largest pool of MCQS in any single volume book so far and is the most updated book available.

- For theory –Just a quick read, no need to memorize anything from Fast aid, while you should cram the MCQs and theory that is given in FCPS pearls Book.

Days	Chapter	Books
Day 1	Chapter Calculations	Points (FCPS Pearls)
Day 2-3	Cell physiology	Theory (Fast aid) + Points (FCPS Pearls)
Day 4-6	Cardiovascular (Physiology + Pathology)	Theory (Fast aid) + Points (FCPS Pearls)
Day 7-9	Gastroenterology (Physiology + Pathology)	Theory (Fast aid) + Points (FCPS Pearls)
Day 10-12	Pulmonology (Physiology + Pathology)	Theory (Fast aid) + Points (FCPS Pearls)
Day 13-15	Nephrology (Physiology + Pathology)	Theory (Fast aid) + Points (FCPS Pearls)
Day 16-18	Hematology	Theory (Fast aid) + Points (FCPS Pearls)
Day 19-21	Oncology	Theory (Fast aid) + Points (FCPS Pearls)
Day 22-24	Endocrinology (Physiology + Pathology)	Theory (Fast aid) + Points (FCPS Pearls)
Day 24-27	Neurology (Neuroanatomy and neurophysiology)	Theory (Fast aid) + Points (FCPS Pearls)
Day 28-29	Musculoskeletal system	Theory (Fast aid) + Points (FCPS Pearls)
Day 30-31	General Pathology	Theory (Fast aid) + Points (FCPS Pearls)
Day 32-33	Immunology	Theory (Fast aid) + Points (FCPS Pearls)
Day 34-35	Microbiology	Theory (Fast aid) + Points (FCPS Pearls)
Day 35-37	Histology	Theory (Fast aid) + Points (FCPS Pearls)
Day 38	Biochemistry	Theory (Fast aid) + Points (FCPS Pearls)
Day 39-40	Pharmacology	Theory (Fast aid) + Points (FCPS Pearls)
Day 41-42	Upper limb	Theory (Fast aid) + Points (FCPS Pearls)
Day 43-44	Lower limb	Theory (Fast aid) + Points (FCPS Pearls)
Day 45-46	Thorax	Theory (Fast aid) + Points (FCPS Pearls)
Day 47-48	Abdomen pelvis and perineum	Theory (Fast aid) + Points (FCPS Pearls)
Day 49	Spinal cord and general	Theory (Fast aid) + Points (FCPS Pearls)
Day 50	Public health sciences	Theory (Fast aid) + Points (FCPS Pearls)
Day 51-55	Feb and May 2024 papers	Platinum File-1 (FCPS Pearls)
Day 56-60	Aug & November 2024 Papers	Platinum File-2 (FCPS Pearls)

LAST 1 MONTH (4 WEEKS) FOR REVISION

PREFACE

- I am deeply thankful to Almighty Allah for the strength to compile this book, designed to be a valuable resource for medical students preparing for FCPS Part-1 and other licensing exams.

- This book aims to provide a concise, focused, and up-to-date guide to simplify preparation. It addresses the challenges students face in navigating vast materials, identifying key topics, and managing time. With clarity and accuracy at its core, this book is structured to make your journey toward success more efficient and manageable.

- This edition is divided into three distinct parts to optimize your preparation:
  - Part 1: Golden File Points
    - All Previous past papers compiled in form of points with relevant theory---arranged chapter wise—more than 400 past papers compiled in few pages
  - Part 2: Platinum File 1
    - Includes all new questions of Golden File18—i.e. February and May 2024 papers.
    - Extracted to save time and avoid unnecessary repetition of the golden file.
  - Part 3: Platinum File 2
    - Includes all new questions of Golden File 19—i.e. August and Nov 2024 papers.
    - Extracted to save time and avoid unnecessary repetition of the golden file.

- This book contains all MCQs from 2015 to date, offering the largest pool of questions, organized and streamlined for efficient preparation.

- Study Smart, Not Hard-----CPSP papers often repeat questions, so stop spending time on the same Golden Files repeatedly. This book covers everything you need without repetition, making your preparation easier and more efficient

- I pray that Allah grants you success in your exams and blesses your efforts. Please remember me in your prayers, and may this book be a source of ease and guidance for all.

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PLATINUM FILE - 1

FEB & MAY 2024 PAPERS - - - 485

PLATINUM FILE - 2

AUG & NOV 2024 PAPERS - - - 557

GOLDEN FILE SPECIAL POINTS

INCLUDES SUMMARIZED

- Golden File Zero (2015 March, April, May Papers)
- Golden File-1 (2015 Sep, Oct, Nov Papers)
- Golden File-2 (2016 March, April, May Papers)
- Golden file-3 (2016 Sep, Oct, Nov Papers)
- Golden file-4 (2017 March, April, May Papers)
- Golden file-5 (2017 Sep, Oct, Nov Papers)
- Golden file-6 (2018 march & may Papers)
- Golden file-7 (2018 Sep &, Nov Papers)
- Golden file-8 (2019 February & April papers)
- Golden File-9 (2019 September and November)
- Golden File-10 (2020 February and July papers)
- Golden File-11 (2020 Sep and November papers)
- Golden File-12 (2021 Feb and June papers)
- Golden File-13 (2021 Sep and Nov papers)
- Golden File-14 (2022 Feb and May Papers)
- Golden File-15 (2022 Aug and Nov Papers)
- Golden File-16 (2023 Feb and May Papers)
- Golden File-17 (2023 Aug and Nov Papers)

Note: Do Read the important note on the next Page before starting

IMPORTANT NOTE

- Golden Files are a collection of all the previous past papers. Each Golden File contains two exams over a six-month period, comprising all past papers.

- This idea came about after receiving messages from students asking for errata. I thought I would provide them with all the Golden Files, which are past papers of CPSP with proper text. This way, they can read and solve MCQs and create their own errata if needed, rather than asking someone else and wasting their time.

- Why read many books when you can have everything in one book? Stop wasting your time and money.

- No book can be 100% error-free, especially when recalling MCQs, so here is the best effort with proper references and text.

- Another question that students repeatedly ask is, "Due to a shortage of time, I am unable to do this Golden File or that." All the Golden Files are almost the same with the addition of a few new questions every year, so I compiled them all in a few pages. (You can thank me later after passing 😊👍)

- As we all know, every CPSP paper consists of 80-90% repeats in every exam. So, why put in extra effort on spending and repeating the same questions, sometimes with different answers too? Why not put them all together along with theory for proper understanding?

- Since there is no repetition of MCQs (InshAllah), it is essential to read this file with proper understanding at least two times before appearing in your exam.

- Those Questions which could not be covered here from the golden files are placed in Golden Blocks.

- I have tried my level best; I hope it proves useful for all of you.

- Save your time, save your money — and thank me later.

- Any suggestions in this file would be highly appreciated.

Good luck

CALCULATIONS

1. CALCULATE THE MEDIAN OF 40, 20, 25, 30, 25, 20, 35, 40

UNDERSTAND THIS CONCEPT.

- Data of a few numbers
- Example: 13, 18, 13, 14, 13, 16, 14, 21, 13

Mean	❖ Is equal to $\frac{sum\ of\ values}{total\ number\ of\ values}$ ✓ Example: o Mean= $\frac{13+18+13+14+13+16+14+21+13}{9} = \frac{135}{9}$ = 15 ans
Median	❖ Middle value of a list of data when arranged in ascending order as shown in example 1 below ❖ But if there even are number of values, the median will be the average of the middle two values as shown in example 2 below ✓ Example: o First arrange in ascending order→ 13, 13, 13, 13, 14, 14, 16, 18, 21 o So median is the middle values which is → 14
Mode	❖ Most common value, if no number in the list is repeated, then there is no mode for the list. ✓ Example: o Mode is 13

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Calculate the median of 40, 20, 25, 30, 25, 20, 35, 40
    - Let's solve
    - Arrangement in ascending order= 20, 20, 25, 25, 30, 35, 40, 40
    - Take two middle values and divide them by 2= 25 +30 /2 = 55/2 →27.5 ans
- Eight patients have entered a trial. Their ages are 20, 20, 30, 35, 40, 25, 25 and 30. The median value in this case is:
    - Arrangement in ascending order= 20, 20, 25, 25, 30, 30, 35, 40,
    - Take two middle values and divide them by 2= 25 +30 /2 = 55/2 → 27.5 ans
- The height of 7 women in cm is 141, 141, 143, 144, 145, 146, 155 respectively. Calculate the mean?
    - Is equal to (sum of values) / (total number of values)
    - = 1015 /7
    - = 145 ans

---

2. 4ML VIAL OF 2% LIGNOCAINE, CONTAINS HOW MUCH LIGNOCAINE?? ANSWER: 80MG

EXPLANATION:

- 2% solution of lignocaine means 2000mg of lignocaine in 100ml of solution.

- It means 1ml of solution will have = 2000/100 => 20mg
- 4ml contains => 4 multiply by 20 = 80mg ans.

---

3. Hb is 10, O2 saturation 90%, PaO2 = 60, calculate O2 content? Answer: 13

Remember Oxygen content:

- Oxygen content = (Hb g/dL × 1.34 × SaO2) + (PaO2 × 0.003)

One another formula

- O2 delivery to tissues= cardiac output × O2 content of blood

Explanation:

- As per Formula for oxygen content = (10 × 1.34 × 90%) + (60 × 0.003)
- Convert 90% = which is 0.9, so above formula becomes as
- oxygen content =(10 × 1.34 × 0.9) + (60 × 0.003)
- oxygen content = 12.06 + 0.18
- oxygen content = 12.24

---

4. Urine conc 100, urine flow rate 2, plasma conc 10 calculate clearance?

- Clearance = UV/P
- Clearance= 100× 2/ 10
- Clearance= 20 ans

---

5. Calculate Clearance? Where Urinary flow 20 ml/min, Concentration of substance in urine 10 and Plasma 20ml/min.

- Clearance= UV/P
- Clearance = 20 × 10 /20 = 10 answer

---

6. Plasma [creatinine] = 1.2mg/100 ml, 24-hour urine volume = 1.4 liters and urine [creatinine] = 144mg/100 ml. The creatinine clearance is most likely to be:

- :C = $\frac{UV}{P}$ (mnemonic: **UV** light shining on **P**ee)
  - where:
    - C = clearance (mL/min or mL/24 hour)
    - U = urine concentration (mg/mL)
    - V = urine volume/time (mL/min)
    - P = plasma concentration (mg/mL)
- Now let's solve.
  - CrCl= 144 × 1.4 / 1.2
  - CrCl = 168 litres/ day answer

---

7. Calculate the GFR when the glomerular hydrostatic pressure is 60 mmHg, Bowman hydrostatic pressure is 12 mmHg and capillary oncotic pressure is 30mmHg= 18 answer

Explanation

- GFR= (PGC – PBS) – (πGC – πBS)
  - πBS is Bowman space oncotic pressure → It is usually zero, and therefore ignored,
- GFR= (60-30) -12 =18

---

8. Regarding Alveolar Ventilation= Tidal volume minus dead space into respiratory rate per min

9. Calculate Alveolar ventilation where Tidal volume is 500ml/respiration. RR 10?

10. IF A PERSON INHALES 500 ML OF AIR DURING EACH BREATH WITH RESPIRATORY RATE 10 BREATHS / MIN. CALCULATE THE ALVEOLAR VENTILATION

REMEMBER:

- Alveolar ventilation: VA= (VT – VD) × Breaths/min

  OR
- simply as Alveolar ventilation: tidal volume – dead space × Breaths/min
- **Explanation of above question now:**
  - Alveolar ventilation = (500 – 150) × 10
  - Alveolar ventilation = 3500mL/min answer

---

11. CALCULATE THE ALVEOLAR VENTILATION RATE WHERE TIDAL VOLUME IS 350ML, DEAD SPACE IS 100ML AND RR IS 18?

- Alveolar ventilation: tidal volume – dead space × Breaths/min
- Alveolar ventilation = (350 – 100) × 18
- Alveolar ventilation = 4500mL/min or 4.5L

---

12. A 60-YEAR-OLD MALE WORKING IN COAL MINE FOR LAST 30 YEARS CAME TO PULMONOLOGIST FOR HIS CHECKUP. HIS FEV1 IS 75% AND HIS ARTERIAL OXYGEN SATURATION IS 94%. HIS ALVEOLAR VENTILATION IS 6000ML/MIN AT A TIDAL VOLUME OF 600ML AND RESPIRATORY RATE OF 12 BREATHS/MIN. THIS PATIENT'S ANATOMICAL DEAD SPACE IS:

AS WE KNOW

- Alveolar Ventilation = (Tidal Volume - Dead Space) × Respiratory Rate
- Given:
  - Alveolar Ventilation = 6000 ml/min, Tidal Volume = 600 ml, Respiratory Rate = 12 breaths/min
- We can rearrange the formula to solve for the dead space:
- Dead Space = Tidal Volume - (Alveolar Ventilation / Respiratory Rate)
- Dead Space = 600 - (6000 / 12)
- Dead Space = 600 – 500
- Dead Space = 100 ml

---

13. CALCULATE THE VD/VT (PHYSIOLOGICAL DEAD SPACE) WHEN PACO2 45MMHG, EXCRETED ALVEOLAR CO2 30MMHG (PECO2) = 0.3

REMEMBER:

- $\frac{Vd}{Vt}$= paCo2-peCo2/paCo2
- Putting values = 45 – 30 / 45
- Answer: 0.33

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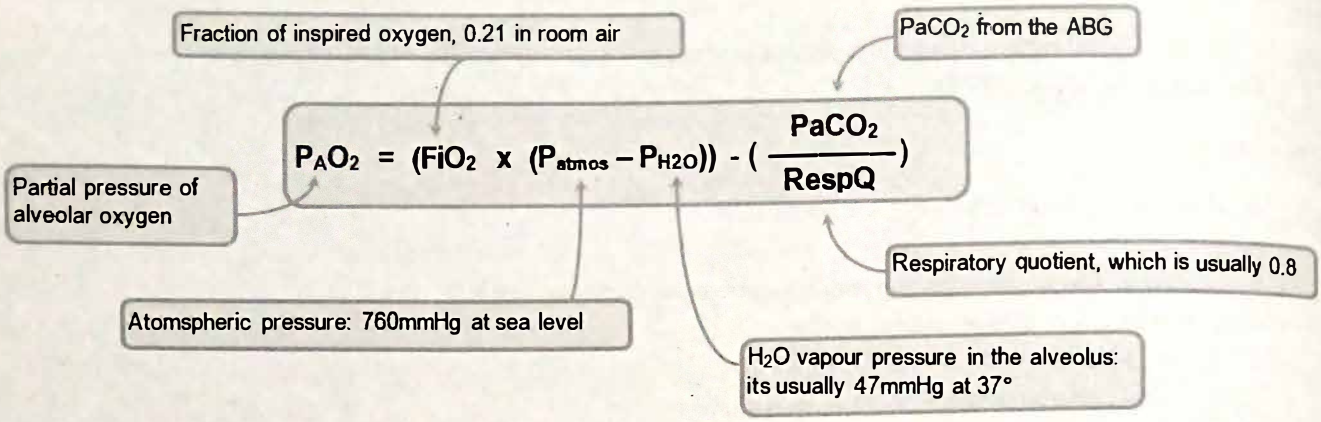
14. PCO2 AT SEA LEVEL IS 48 PERCENT, WHAT WILL BE THE PO2= 90

REMEMBER:


Fraction of inspired oxygen, 0.21 in room air
PaCO₂ from the ABG
Partial pressure of alveolar oxygen
Respiratory quotient, which is usually 0.8
Atomspheric pressure: 760mmHg at sea level
H₂O vapour pressure in the alveolus: its usually 47mmHg at 37°

$$P_AO_2 = (FiO_2 \ x \ (P_{atmos} - P_{H2O})) - (\frac{PaCO_2}{RespQ})$$

So, for atmospheric pressure equation will become as from above equation

- PO2 =FiO2(Patm-PH2O)-PCO2/Respiratory quotient
- PO2 = 0.21 (760-47) -48/0.8
- PO2 = 0.21 (713) - 60
- PO2 = 149.73 - 60
- PO2 = 89.3 almost 90 (which was in options)

15. IF ATM PRESSURE IS 630, PCO2 34 AND RESPIRATORY QUOTIENT 0.8 WHAT IS PO2= 80

EXPLANATION

- PO2 =FiO2(Patm-PH2O)-PCO2/Respiratory quotient
- PO2 = 0.21 (630-47) -34/0.8
- PO2 = 0.21 (583) - 42
- PO2 = 122 - 42
- PO2 = 80

16. CALCULATE THE EJECTION FRACTION OF HEART RATE =70BEATS/MIN, CO=5.6L, EDV=160ML?

- Change 5.6 L into mL first = 5600mL
- **AS WE KNOW EF= SV/EDV**
  - Here SV value missing, lets first calculate that As
  - **CO= SV × HR**
  - So, this means SV= CO/HR → 5600/70 → 80
- Putting value in above formula EF= 80/160ml
- **EF= 0.5**

17. CALCULATE THE EDV WHEN STROKE VOLUME IS 70 AND ESV IS 50ML= 120

EXPLANATION

- Stroke volume = End-diastolic volume − End-systolic volume
- So here
- EDV= Stroke volume + ESV
- EDV= 70+ 50
- EDV= 120

18. SYSTOLIC PRESSURE 132 AND DIASTOLIC 66, WHAT IS THE MEAN ARTERIAL PRESSURE?

- **REMEMBER**

1. **Pulse Pressure:**

	Systolic pressure – diastolic pressure
2.	**Mean Arterial Pressure:**
	Diastolic pressure + $1/3^{rd}$ pulse pressure or 2/3 Diastolic pressure + 1/3 systolic pressure

EXPLANATION OF ABOVE QUESTION NOW:

- **1st method:**
    - First calculate pulse pressure
    - Pulse pressure= systolic – diastolic
    - Pulse pressure= 132-66
    - Pulse pressure= 66
    - Now MAP
    - MAP= diastolic pressure+$1/3^{rd}$ of pulse pressure
    - MAP= 66+22
    - **MAP= 88 ans**

- **2nd method:**
    - MAP=$2/3^{rd}$ diastolic pressure +$1/3^{rd}$ systolic pressure
    - MAP= 2/3 (66) + 1/3 (132)
    - MAP= 44+44
    - **MAP= 88 ans**

---

19. DURING TEACHING SESSION, THE CARDIOLOGIST ASKED A GROUP OF MEDICAL STUDENTS TO CALCULATE THE MEAN ARTERIAL PRESSURE OF A PATIENT. ON EXAMINATION DIASTOLIC ARTERIAL PRESSURE WAS 66 MMHG, SYSTOLIC ARTERIAL PRESSURE 132 MMHG AND CENTRAL VENOUS PRESSURE 1 MMHG. HIS MEAN ARTERIAL PRESSURE WAS:

AS WE KNOW

- MAP=$2/3^{rd}$ diastolic pressure +$1/3^{rd}$ systolic pressure
- MAP= 2/3 (66) + 1/3 (132)
- MAP= 44 + 44
- MAP= 88 answer

---

20. MATERNAL MORTALITY, MATERNAL DEATHS PER? = 100,000

REMEMBER THESE MCQ'S.

- MMR= number of maternal deaths/ total number of live births × 100,000
- Perinatal mortality rate and still birth calculated in= 1st week

---

21. HIV POSITIVE AND NEGATIVE PT. VALUES 10050 AND 99020. CALCULATE THE SENSITIVITY?

Note: as this question was in paper, so I have included this, but this question is incomplete, so for explanation and understanding here is another question)

- A rapid finger-prick blood test to help diagnosis deep vein thrombosis is developed. Comparing the test to current standard techniques a study is done on 1.000 patients: from the below values, calculate the sensitivity of the new test?

	DVT present	DVT Absent
New test positive	200 (True Positive)	100 (False Positive)
New test negative	20 (False Negative)	680 (True Negative)

SOLUTION:

- We know that
- Sensitivity= $\frac{TP}{TP+FN}$,
- So, answer would be = $\frac{200}{200+20}$ = 200/220 = 0.90 ans

---

22. THERE ARE TWO GROUPS OF PREGNANT WOMEN 100 WORKING AND 110 HOUSEWIVES. 40 WORKING WOMEN HAD LBW BABIES WHILE 21 HOUSEWIVES HAD LBW BABIES. CONSIDERING WORKING OUT AND STRESS AS THE RISK FACTOR FOR LBW BABIES, CALCULATE THE RELATIVE RISK?

EXPLANATION

	LBW babies	Normal babies
Working women (total 100)	40 (a)	60 (b)
Housewives (total 110)	21 (c)	89 (d)

=Now as we know relative risk= $\frac{a/a+b}{c/c+d}$

= $\frac{40/100}{21/110}$ = 0.4/0.19= **2.1 ans**

---

23. IF THE HEART RATE IS DOUBLED DURING EXERCISE, THEN THE CARDIAC CYCLE WILL COMPLETE IN=0.4S

- ✓ Assuming a healthy heart and a typical rate of 70 to 75 beats per minute, each cardiac cycle, or heartbeat, takes about 0.8 seconds to complete the cycle
- ✓ HR Double, cardiac cycle would be completed in half time i.e. = 0.4

---

24. A PATIENT BREATHING IN DECOMPRESSED CHAMBER WHERE THE BAROMETRIC PRESSURE IS 250 MMHG (27000 ALTITUDE, 1/3 ATMOSPHERIC). THE OXYGEN SATURATION WILL BE= 20%

EXPLANATION:

- O2 CONTENT = P02/ATM
  - Normal PO2 in atm=160mmhg
  - Here 1/3rd so----- 160/3=53
- PUTTING THIS IN ABOVE FORMULA I.E., O2 CONTENT = P02/ATM
  - Oxygen content of blood= 53/250 = 0.21
  - 0.21 x 100 =21

---

25. A 60-YEAR MALE WEIGHING 70 KG HAS TOTAL BODY WATER OF 42L (60% OF BODY WEIGHT). HOW MUCH OF THIS WILL BE PRESENT IN INTERSTITIAL FLUID=10.5L

REMEMBER:

- **60-40-20 rule**
  - TBW is **60%** of body weight, ICF is **40%** of body weight., ECF is **20%** of body weight
    - So------Total body water in liters in a 70kg person is → 70 × 0.6 = 42 L
    - ---------ICF in liters in a 70kg person is → 70 × 0.4 = 28 L
    - ---------ECF in liters in a 70kg person is → 70 × 0.2 = 14 L
    - ✓ ECF is Further divided into
      - Plasma: 1/4th of ECF
      - Interstitial fluid: 3/4th of ECF
- Noe lets solve the above MCQ
  - So, If ECF is 14 L
  - it means plasma is Interstitial fluid is = 3/4 (ECF)
  - Interstitial fluid = 3/4 (14)

  - Interstitial fluid= 10.5 ans (Remember the closest option in paper was 11)

---

26. In mountain, the atmospheric pressure 700. Calculate the value of O2 and nitrogen in it= pO2 147 and pNO2 546

LET'S SOLVE

- As o2 in air about 21% so
  - 700 × 0.21 =147
- N2 is 78% so
  - 700%×0.78=546

CHAPTER # 2

CELL PHYSIOLOGY

27. LIPID BILAYER OF CELL MEMBRANE HAS CHOLESTEROL IN ITS STRUCTURE, THE FUNCTION OF THIS CHOLESTEROL IN THE MEMBRANE IS = PERMITS ION MOVEMENT

REMEMBER:

- Cell Membrane Composition: Proteins: 55%, Lipids: 40%, Carbohydrates: 5%
- Lipid Bilayer:
  - Made up of phospholipid molecules arranged in a bilayer structure.
  - Hydrophilic end: Soluble in water (phosphate end).
  - Hydrophobic end: Soluble in fats (two fatty acid tails).
  - The lipid layer is semipermeable:
    - Fat-soluble substances (e.g., oxygen, CO_2, steroids, alcohol) pass easily.
    - Water-soluble substances (e.g., glucose, urea, electrolytes) pass through channels or carriers.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- The lipid bilayer of the cell membrane is highly soluble for = CO2.
- Maximum permeability of the cell membrane is to = Water.
  - Note---The plasma membranes of many cells also contain water channel proteins (aquaporins), through which water molecules are able to cross the membrane much more rapidly than they can diffuse through the phospholipid bilayer
- Integral proteins in cell membrane are joined to lipids of membrane by = Hydrophobic bonds.
- O2 and CO2 diffuse through cell membrane because = They are lipid soluble

KNOW THE DIFFERENCE

- Water enters the cell by which of the following process=Through pores
  - Water absorption across cell membrane by=Pores
- Water goes from plasma to interstitial fluid by which process= Filtration
- Water from cell enters the extra cellular space via which process= Filtration

---

28. WHICH OF THE FOLLOWING ORGANELLE CONTAIN OXIDASES= PEROXISOME

REMEMBER:

RER	❖ Synthesis of proteins ❖ Degradation of worn-out organelles ❖ Continuous with nuclear membrane
SER	❖ Synthesis of lipids and steroids ❖ Storage and metabolism of calcium ❖ Catabolism and detoxification of toxic substances
Ribosomes	❖ Synthesis of proteins ❖ Basophilia of cell is due to Ribosomes
Golgi apparatus	❖ Processing, packaging, labelling and delivery of proteins and lipids
Lysosomes	❖ Arise from Golgi apparatus

	❖ Contain hydrolases ❖ Cause degradation of unfolded proteins ❖ Uterus and breast regress after pregnancy by lysosomes ❖ On H & E stain: hollow structure around nuclei
Peroxisomes	❖ Originate from SER ❖ Contain oxidase, H_2O_2 and catalase ❖ Single membrane, long chain fatty acids oxidation ❖ Catabolism of amino acids and ethanol
Centrosome	❖ Movement of chromosomes during cell division
Mitochondria	❖ Energy house of the cell. Self-replicative (contains its own DNA) ❖ Synthesis of ATP ❖ Initiation of apoptosis ❖ Contains anticardiolipin antibody ❖ Protein proton gradient occurs here (helps in ATP synthesis) ❖ Electron transport chain present
Nucleus	❖ Control of all activities of the cell ❖ Synthesis of RNA ❖ Sending genetic instruction to cytoplasm for protein synthesis ❖ Control of cell division and Storage of hereditary information in genes (DNA)
Nucleolus	❖ No limiting membrane ❖ Part of nucleus and Site of RNA synthesis
Cytoskeleton	❖ Shape and Stability of cell shape, Cellular movements

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

MITOCHONDRIA

- Which organelle is self-replicating= Mitochondria
    - It also comes as
        - How Inc in no. Of mitochondria occurs=Self-Replication
- Mitochondria is self-replicative organelle as they have=DNA
    - It also comes as
        - Which organelle has a DNA and so the ability to self-replicate= Mitochondria
        - In addition to the nucleus, DNA is also present in= Mitochondria
- Anticardiolipin antibody is present in=Mitochondrial membrane
    - It also comes as:
        - Cardiolipin receptor is present in = Mitochondria
- Protein proton gradient occurs in=Mitochondria
    - It also comes as
        - Proton gradient is helpful in the working of which of the following= Mitochondria
- The cell which would contain many mitochondria in its apical portion is= Ciliated cells
    - It also comes as
        - Increase number of mitochondria are present in apical layer of which cell=Cilia
        - Increase mitochondria is present in apical part of which of following = Ciliated muscle
- Electron transport chain is present in= Mitochondria
- Which organelle is the energy house of the cell= Mitochondria
- The proteins found in the mitochondria are primarily synthesized by= Free ribosomes
- Regarding red blood cells, the most appropriate statement is= Do not contain mitochondria
- Free radical formation in a cell is formed by = Mitochondria

- Intramitochondrial protein synthesis is carried out by = Nuclear gene
- Student is watching organelle under microscope which is in dividing stage= Mitochondria
  - Remember ---Organelle in dividing phase is mitochondria.
  - While Cell in dividing phase is centriole.

RIBOSOMES

- In protein synthesizing cells Basophilia is due to= Ribosomes
  - It also comes as
    - Basophilia of cell is due to= Ribosomes (Ribosomes> RER)
    - Cells get stained basophilic due to= Ribosomes
    - Staining property of cell is due to= Ribosomes
    - Polychromasia in erythropoiesis is due to= Hb Ribosomes
    - Basophilia of erythrocytes is due to= Ribosomes
    - A slide of parotid gland showing acini with dark reddish-purple cells. The most likely cell organelle responsible for cytoplasmic basophilia is= Rough endoplasmic reticulum (Ribosomes> RER)
    - The microscopic study of pancreas shows basophilia in the cytoplasm of cells. The organelle responsible for this basophilia is= Ribosome
    - Eosinophilia in Apoptosis and necrosis will occur due to= Loss of RNA

ENDOPLASMIC RETICULUM

- Nuclear membrane is continuous with= RER
- Which organelle is continuous with nuclear membrane= RER
  - It also comes as
    - Nuclear membrane Is continuous with = rough endoplasmic reticulum of cytoPlasm
- Nucleus envelops= Endoplasmic reticulum
- The site of drug detoxification is= Smooth endoplasmic reticulum
- Protein synthesis mostly requires=MRNAs, nucleotides, tRNAs, ribosomes and many enzymes
- Protein synthesis occurs in= RER
  - It also comes as
    - Rough endoplasmic reticulum is involved in the process of=Protein synthesis
    - Rough endoplasmic reticulum is an important cell organelle. It is most commonly=The site of protein synthesis
- Which of the following organelle is needed for steroids metabolism=SER
  - It also comes as
    - In steroid-producing tumors, which organelle is primarily involved in steroid synthesis= Smooth endoplasmic reticulum
    - The site of steroid hormone synthesis is= Smooth endoplasmic reticulum
- The symmetry of cell membrane is established primarily by one of the following= Membrane synthesis in endoplasmic reticulum
- Nissl bodies are mainly present in= RER
  - While Nissl bodies are absent in= Axon hillock

LYSOSOMES

- After delivery uterus regress by= Lysosomes
  - It also comes as
    - Few months after parturition, the gradual regression of the enlarged uterus and breast is the function of= Lysosomes
    - A Few week after delivery, the regression of enlarged uterus and breast takes place due to activity of= Lysosome
    - After pregnancy and parturition, uterus size reduced by= Lysosomes
- Regarding lysosomes what is true= Contains hydrolytic enzymes

- True regarding lysosome is=It contains hydrolase
- A Few weeks after delivery, the regression of enlarged uterus and breast takes place due to activity of=Lysosome
- On H & E staining a student sees the hallow structure around the nucleus. What could it likely be=Lysosomes
- A child presents with blindness and mental retardation. On histology his lysosomes show a deficiency of Hexosaminidase-A. The child is suffering from= Tay-sach
- Tay Sachs disease of= Lysosomes
- Which enzyme deficiency causes Pompe disease= Lysosomal alpha glucosidase enzyme
- Type of endocytosis that occurs in lysosomes is= Phagocytosis
- Primary lysosomes are membrane bound intracellular organelles that contain= Acid phosphatase

PEROXISOME

- Very long chain fatty acids are catalyzed in= Peroxisomes
    - It also comes as
        - In the cell, peroxisomes= Are concerned with catabolism of very long chain fatty acids
- In cells, the enzyme Oxidases are present in=Peroxisomes
- In cells, the enzyme Oxidases and H2O2 are present in= Peroxisomes
- Alcohol detoxification is done by= Peroxisome
- Hydrogen per oxide is found in=Peroxisome
- Bactericidal agents such as O2 and H2O2 are produced in neutrophils from= Peroxisomes
- Peroxisomes are formed by self-replication by budding off from= Smooth endoplasmic reticulum (SER)
- Neutrophils kill bacteria by Reactive oxygen species (ROS) which are produced by= Peroxisomes

GOLGI APPARATUS

- Fatty acid and glycerol combine in=Golgi apparatus
- Fatty acids converted to neutral fats in= Golgi apparatus
- Final packaging and release of substances occur from which organelle in the cell= Golgi apparatus
    - It also comes as
        - Packing and transport of carbohydrates and protein is done by=Golgi apparatus
        - The organelle that combines proteins with carbohydrates and packages them within vesicles for secretion is the= Golgi complex
        - Packing and transport of carbohydrates and protein is done by= Golgi apparatus
- The organelle which is scaner shaped cisternae with concave surface facing nucleus is= Golgi apparatus
- Secretory vesicles of the cells are synthesized in= Golgi apparatus
- Misfolded proteins formed by Golgi are degraded by= Proteasome
    - It also comes as
        - During protein synthesis in endoplasmic reticulum and golgi apparatus, defective structures are detected, and abnormal proteins are degraded in= Proteosomes

NUCLEOLUS

- Molecules of rRNA is synthesized in= Nucleolus
- Ribosomes RNA are a major constituent of= Nucleolus
- The most likely feature of nucleoli is= Do not have limiting membrane
- A cell active in protein synthesis will have= Dense Prominent nucleolus

KNOW THE DIFFERENCE

- Thyroid hormone receptors are found at=Nucleus
- Most growth hormone have their receptor located on= Plasma membrane
- Receptors for tyrosine kinase present in= Cell membrane
- Endotoxin present in bacteria are a part of= Outer cell membrane
- How do erythrocytes prevent from oxidative stress=HMP shunt

- The nature of drug receptors present on cell membranes is = Protein.
- Tyrosine kinase receptors are present in = Outer cell membrane.
- Activation of cyclic AMP-dependent mechanisms in cell membranes is a function of = Enzymes.

29. WHAT CYTOSKELETAL STRUCTURE CONNECTS EXTRACELLULAR MATRIX TO INTRACELLULAR =INTERMEDIATE FILAMENTS

REMEMBER

- Cytoskeletal to ECM= integrin
- Cytoskeletal ECM to ICM= intermediate filament
- ECM to ICM= Integrin
- **C**ell to **C**ell adhesion= **C**adherin (important in case of metastasis)
- Firm adhesion = LFA-1 > Integrin
- Transient adhesion = Selectins

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Which of the following refers to the interwoven network = Intermediate filaments
- Tumor spreads by= Loss of E cadherin
- Metastasis occurs due to=Degradation of E-cadherin
  - Mechanism of tumor metastasis is=Down regulation of E-cadherin
- Which of the following helps in transmission of rapid action potential between cells=Gap junctions
  - It is also asked as
    - The anatomical basis of conduction in the heart is = Gap junctions
    - Heart act as syncytium due to= Gap junctions
- Desmosomes are made up of= Cytokeratin, Cadherin, Intermediate filaments
- Which structure connects the two epithelial cells= Tight junction
- The extracellular matrix and the cytoskeleton communicate across the cell membrane through which of the following= Integrin
- A small silver piece stuck in wood becomes embedded in the finger of a 25-year-old man. He does not remove it, and over the next 3 days the area around the sliver becomes red, swollen, and tender. Neutrophils migrate into the injured tissue. Expression of which of the following substances on endothelial cells is most instrumental in promoting this inflammatory reaction=E-selectin
- Which molecule best helps in transient adhesion of WBC to endothelium= Selectin
- A child with multiple infections was diagnosed with a rare genetic diagnosis where leukocyte adhesion to endothelial cells is deficient. The likely deficiency is of which of the following= LFA-1
  - **Don't get confused with the earlier option of selectin ----here is the explanation.**
    - Circulating leucocytes initially tether via selectins to endothelium, then firmly adhere to endothelium via β1 and β2 integrins—upregulates Leucocytes integrins LFA-1 and MAC-1—and both of them can bind to endothelial ICAM-1

30. GLUCOSE TRANSPORT THROUGH PLACENTA VIA = FACILITATED DIFFUSION

REMEMBER

Active transport	Movement of substances across cell membrane in combination with carrier proteins against concentration gradient (uphill) by utilization of energy is called active transport ❖ **Primary Active Transport: Uses ATP directly for energy.** ▪ Na+-K+ ATPase pump: Moves 3 Na+ out and 2 K+ in; inhibited by cardiac glycosides (e.g., digitalis). ▪ Ca2+-ATPase pump: Moves calcium into organelles (e.g., sarcoplasmic reticulum, mitochondria) using ATP. ▪ H+-K+ ATPase (proton pump): Moves hydrogen ions in the stomach (for acid formation) and kidneys (for secretion); inhibited by proton pump

<table>
<tr><td></td><td>inhibitors (e.g., omeprazole).
❖ Secondary Active Transport: Uses concentration gradient for energy.
▪ Na+-glucose co-transport (symport): Na+ moves downhill, providing energy for glucose to move uphill.
▪ Na+-Ca2+ counter transport: Na+ moves downhill, providing energy for Ca2+ to move uphill in the opposite direction.</td></tr>
<tr><td>Passive transport</td><td>Transport which does not require metabolic energy, includes diffusion and osmosis
<table>
<tr><th>Simple Diffusion</th><th>Facilitated Diffusion</th><th>Osmosis</th></tr>
<tr><td>❖ Not carrier mediated
❖ Movement of substances, across cell membrane down an electrochemical gradient (downhill)</td><td>❖ Carrier mediated
❖ Movement of substances, across cell membrane down an electrochemical gradient (downhill)
❖ Cannot rise greater than the Vmax level</td><td>❖ It is defined as the movement of water (or any other solvent) from low solute concentration to higher solute concentration, through a semipermeable membrane.</td></tr>
</table></td></tr>
</table>

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

ACTIVE TRANSPORT

- ❖ The active transport across cell membranes = requires energy production by the cell
- ❖ Active transport of ions across the cell membrane of a cell is mainly due to: = Pumps
  - o It also comes as
    - ▪ Active transport requires = Pump
- ❖ Regarding Choroid plexus = Active transport of sodium ions
- ❖ Drug that inhibits H+/k pump is? = Omeprazole
- ❖ From the basolateral membrane of renal epithelium, sodium is absorbed by = Na-K pump
- ❖ The absorption of glucose in kidneys occurs through which mechanism = Secondary active transport
- ❖ Glucose and amino acids are reabsorbed in proximal tubule by = Secondary Active transport
- ❖ Absorption of Amino acid and glucose in duodenum and jejunum = Active transport

DIFFUSION

- ❖ Rate of simple diffusion across the cell membrane is inversely proportional to = Thickness of the membrane
  - o It also comes as
    - ▪ Which transport type depends on cell membrane thickens = Diffusion
    - ▪ The rate of diffusion of a solute across the cell membrane depends on: = Total surface area of the membrane
    - ▪ Diffusion of gas is directly proportional to = Surface area of the alveolocapillary membrane
    - ▪ Which factor is directly proportional for oxygen diffusion = Alveolar capillary surface area
    - ▪ Oxygen diffusion is directly proportional to = Alveolar capillary surface area
- ❖ Diffusion of CO2 from blood to alveoli occurs through which process = Passive Diffusion
  - o It also comes as
    - ▪ Gaseous exchange in lung and blood occurs through = Passive diffusion
    - ▪ By which mechanism does Oxygen pass from alveoli into blood = Passive Diffusion/simple diffusion
    - ▪ Oxygen enters capillaries from alveoli by which process = Passive diffusion
    - ▪ Oxygen is transferred from alveoli to pulmonary capillaries by = Passive diffusion

- ❖ CO2 diffuses rapidly than O2 through the alveoli due to = High diffusion coefficient
  - o It also comes as
    - ▪ CO2 crosses the alveolar membrane with greater ease than O2 because of its= Greater diffusion coefficient
- ❖ The PO2 in arterial blood less than pO2 in pulmonary artery because = Oxygen need pressure gradient for diffusion
- ❖ Diffusion of a particle depends on its size. Which of the following has the highest relative diffusion capacity = Water
- ❖ Local anesthesia crosses the placenta through = Simple diffusion
  - o Do not confuse it with this MCQ
    - ▪ Transport of glucose across placenta is carried out by = Facilitated diffusion
- ❖ The passive transport across the cell membrane involving carrier proteins is: = Facilitated diffusion
- ❖ The transport process where glucose crosses the cell membrane based on its concentration gradient = Facilitated diffusion
  - o It also comes as
    - ▪ The transport of glucose across a cell membrane is through = Facilitated diffusion
- ❖ V-max always occurs in = Facilitated diffusion
- ❖ Which of the following is absorbed from the small intestine by facilitated diffusion = Fructose
  - o It also comes as
    - ▪ Substance absorbed by facilitated diffusion: Fructose in duodenal cells
    - ▪ Facilitated diffusion of which substance occurs in intestine = Fructose
    - ▪ Which of the following is absorbed from the small intestine by facilitated diffusion = Fructose
  - o Don't Confuse this MCQ with:
    - ▪ Which of the following substances must be further digested before it can be absorbed by specific carriers in the intestinal cells = Sucrose
- ❖ Glucose entry into muscle cells is = Carrier-mediated
- ❖ Passive transport which is carrier mediated = Facilitated transport

ALSO REMEMBER THIS:

- ❖ Which of the following is maximum in semen composition = Fructose
- ❖ Regarding Cell membranes= In some tissues permit the transport of glucose at a greater rate in the presence of insulin
- ❖ Passage of drugs across biological membranes by simple diffusion = Is not saturable
- ❖ Decrease in the rate of diffusion of a substance will occur due to the increase in = its molecular weight

31. A DRUG WITH MOLECULAR WEIGHT MORE THAN 1000 DA, WILL GO INTO CELL BY WHICH PROCESS= PINOCYTOSIS

NOTE THAT

- ❖ If a Drug molecular weight less than 1000-Da transport occurs via= diffusion
- ❖ If a Drug molecular weights greater than 1000-Da transport occurs via= Pinocytosis

ALSO REMEMBER THESE MCQ'S

- ❖ The transport through the cell membrane which involves actin, myosin, and clathrin is: = Pinocytosis
- ❖ The cell membrane = supplies the membrane for pinocytic vesicles.

32. RESTING MEMBRANE POTENTIAL ACHIEVED BY = K EFFLUX

REMEMBER

Depolarization	Due to Na+ influx
Repolarization	Due to K+ outflux
Hyperpolarization	After action potential is over, K+ channels remain open, membrane

	potential becomes close to the k+ equilibrium
Plateau of action potential	Ca++ in while K+ out
Resting membrane potential	Achieved by = K efflux while maintained by = N-K ATPase Pump

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

ACTION POTENTIAL

- Depolarization due to = Influx of Na
    - But it is different in organ of Corti
        - Which of these is responsible for depolarization of action potential in organ of Corti = K influx to hair cell
        - Hair cells in ear are unusual in that they use K+ influx for depolarization rather than Na+
        - Utricle hair depolarization due to = K+ influx
- Repolarization due to = K efflux
    - It also comes as
        - Neuronal repolarization is due to = K efflux
        - Hyperpolarization of neurons due to = Efflux of K
        - After hyperpolarization in action potential, there is increase of which of the following = K+
- Action potential is reduced due to = Hyponatremia
    - It also comes as
        - In 40% deep burn cases, ion lost causing decrease action potential is = Hyponatremia
        - A pt. with 40% burn. There is loss of water and electrolytes. Which of the following electrolytes abnormality will be present associated with low-voltage of action potential = Hyponatremia
- A drug completely blocks Na+ channels in nerves. Which of the following effects on the action potential would it be expected to produce = Block the occurrence of action potentials
    - It also comes as:
        - When a nerve fiber placed in Na free solution is stimulated, there is = No action potential
        - Nerve placed in Sodium Free water medium. Threshold stimulus was given. What will happen next = No Action Potential
        - Na inactivation gate closing represent which phase of action potential = Absolute refractory period
- Local cell response to action potential is = Inc amplitude with Inc stimulus
- True regarding action potential is = Subsequent action potential can summate
- Excitation of nerve trunk is shown by = Compound potential
- Potential recorded after stimulating nerve trunk (depolarization) is = Compound action potential
- Regarding myelinated fibers = Action potential at internodes
- A fisherman after burn was brought to ER. Which of the following electrolyte imbalance causes a decrease the height and slope of action potential = Hyponatremia
    - It also comes as
        - Which of the following decrease the height and slope of action potential = Hyponatremia

RESTING MEMBRANE POTENTIAL

- Resting membrane potential is maintained by = Na/K ATPs pump
- Mechanism of the resting membrane potential across the cell membrane involves mainly = Outward diffusion of potassium ions
    - It also comes as
        - If the resting membrane potential of a nerve cell decreases, there is a/an = Loss of potassium ions from the cell

- The resting membrane potential in neurons: = Depends largely on movement of potassium through passive channels
- Resting membrane potential in a nerve fiber depends more on = K+ equilibrium potential
- The most important diffusible ion in the establishment of the membrane potential is = K+

FOUR CONFUSING MCQ'S

- ❖ Hypokalemia in neurons causes= Hyperpolarization
- ❖ Hyperexcitability of nerves occur if Dec extracellular= Calcium ion
- ❖ Nerve stimulation is more difficult to create an action potential in which conditions= Hypokalemia
- ❖ Decrease height of action potential occurs in=Hyponatremia

ALSO, REMEMBER THESE

- ❖ Regarding Cat-electrotonic potential= All or none potential
- ❖ The initiation of an action potential in skeletal muscle by stimulating its motor nerve= Requires the release of acetylcholine
- ❖ The slow waves in small intestinal smooth muscle cells are= Oscillating resting membrane potentials
- ❖ The EEG usually exhibits rhythmical potential fluctuations. The underlying rhythmic neuron activity of the cortex has its pacemaker chiefly in= Reticular formation
- ❖ Receptors act as transducers=By increasing response to repeated stimulus

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33. ACTION POTENTIAL SLOW DEPOLARIZATION IN SA NODE IS CAUSED BY= NA+ INFLUX

REMEMBER ACTION POTENTIAL CYCLE IS DIFFERENT IN PACEMAKER AND VENTRICLES AND ATRIA

- ❖ **ACTION POTENTIAL IN VENTRICLES, ATRIA, AND THE PURKINJE SYSTEM**
  - o Phase 0
    - Voltage-gated Na+ channels open.
  - o Phase 1----initial repolarization
    - Inactivation of voltage-gated Na+ channels & Voltage-gated K+ channels begin to open.
  - o Phase 2 --- Plateau of action potential
    - Ca2+ influx through voltage-gated Ca2+ channels balances K+ efflux.
  - o Phase 3 --- Rapid repolarization
    - Massive K+ efflux due to opening of voltage-gated slow K+ channels
  - o Phase 4----Resting membrane potential
    - Is a period during which inward and outward currents are equal and the membrane potential approaches the K+ equilibrium potential.

- ❖ **PACEMAKER ACTION POTENTIAL**
  - o Phase 0 --- Upstroke
    - Opening of voltage gated Ca2+ channels.
    - Fast voltage-gated Na+ channels are permanently inactivated because of the less negative resting potential of these cells.
  - o Phases 1 and 2
    - Are absent.
  - o Phase 3----Repolarization
    - Inactivation of the Ca2+ channels and ↑ activation of K+ channels → ↑ K+ efflux.
  - o Phase 4 ----slow depolarization.
    - Accounts for the pacemaker activity of the SA node (automaticity).
    - Is caused by an increase in Na+ conductance, which results in an inward Na+ current called If.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

ACTION POTENTIAL AND PLATEAU PHASE IN CARDIAC MUSCLE

- Depolarization in action potential of ventricular muscle is caused by = Na influx
- Heart ventricles decreased upstroke due to = Prolonged sodium channels opening
- Regarding plateau phase in cardiac muscle, correct is = Equal Ca influx and K efflux occurs
- Plateau of action potential in cardiac tissue is due to = Ca & K (Ca++ In while K out)
- Cardiac muscle cannot be tetanized because = Long refractory period

SA NODE AND PACEMAKER ACTIVITY

- The SA node = Spontaneously generates impulses which produce rhythmic heartbeat
- Which of the following has the most prominent pre-potential = SA node
- The action potentials in the pacemaker SA node are mostly due to = Ca+ influx
- Action potential slow depolarization phase in SA node is caused by = Na+ influx
    - It also comes as
        - Phase 4 depolarization produced in SA node is due to = Inward Na current
- The parasympathetic effect on the heart increases permeability in SA node to = Potassium
    - It also comes as
        - Vagal stimulation depresses myocardial activity by = Enhancing potassium efflux in the SA node
        - Stimulation of parasympathetic nerves to the heart decreases heart rate by = Increase in permeability of K through SA node
- Regarding Adenosine= Blocks SA node and AV node conduction

---

34. FIRST OBSERVABLE SIGN OF IRREVERSIBLE CELL INJURY IN CARDIAC CELL=CONTRACTION BANDS IN CYTOPLASM

- Also remember ---First observable sign of irreversible cell injury in cardiac cell = Contraction bands in cytoplasm
- Signs of reversible cell injury → Cellular swelling, ER swelling, Myelin figures
- While Signs of irreversible injury→ Karyolysis (nuclear fading due to enzyme digestion of DNA), Karyorrhexis (nuclear fragmentation), Pyknosis (nuclear condensation), Necrosis and apoptosis
- Note these key words
    - Early sign of reversible cell injury--- cellular swelling
    - Most prominent sign of reversible cell injury---Cellular swelling

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Every time they test you with different options just clear your concepts from the theory statements given

IRREVERSIBLE CELL INJURY

- Most reliable sign of irreversible cell injury = Lysosomal enzyme release
    - It also comes with different options
        - Regarding irreversible cell injury, the most important is = Massive Ca influx (most preferred option)
        - Most reliable sign of irreversible cell injury = Autophagy of cell
- The central factor in the pathogenesis of irreversible cell injury is = Membrane damage.
    - It also comes as
        - Regarding irreversible cell injury most imp is = Rupture of cell membrane and release of cellular enzymes
- Large mitochondrial densities indicate = Irreversible cell injury
    - It also comes as
        - A cell was being studied under microscope which showed large mitochondrial densities, it indicates = Irreversible cell injury

    - Mitochondrial inclusions with large amorphous densities occur in = Irreversible injury
    - Condensed nuclei in cells and massive mitochondria are features of = Irreversible injury
- Patient has MI, angiograph was done showing 90% artery blocked. Signs of irreversible cell injury = Karyorrhexis
- Irreversible damage to the nucleus shows as = Karyolysis
- Cell shrinkage, cytoplasmic blebs are feature of = Irreversible cell injury
- Which of the following is the earliest observable sign irreversible cell change in MI is = Contraction bands in cytoplasm
  - It also comes as
    - The first observable sign of irreversible cell injury in a cardiac cell is = Contraction bands in the cytoplasm.
    - A feature seen in cocaine-induced MI = Contraction band necrosis

REVERSIBLE CELL INJURY

- Characteristic of reversible cell injury = Cellular swelling
- Early sign of reversible cell injury is = ER swelling
- One of the first structural changes evident in reversible ischemic cell injury is = Swelling of Endoplasmic reticulum
- Cell swelling in hypoxic cell injury is due to = Entry of extracellular water
- What is the first sign of reversible cellular damage = Ballooning or hydropic changes secondary to mitochondrial injury

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35. SIMILARITY BETWEEN CARDIAC AND SKELETAL MUSCLE IS= TRANSVERSE STRIATIONS

NOTE THE COMPARISON OF SKELETAL, SMOOTH AND CARDIAC MUSCLE

Skeletal muscle	Cardiac muscle	Smooth muscle
• Striated	• Striated	• Non-striated
• Voluntary	• Involuntary	• Involuntary
• No intercalated disc	• Intercalated disc present and a characteristic feature.	• No intercalated disc
• Very rapid contractions	• Rapid contractions	• Slow contractions
• Multinucleated	• Uni-nucleated	• Uni-nucleated
• Contains troponin-C so forms Ca^{2+}-troponin c	• Ca^{2+}-troponin C	• Does not contains troponin instead contains calmodulin so forms Ca^{2+}-calmodulin
• Contains T- tubules	• Contains T- tubules	• Lacks T-tubules
• Actin and myosin form sarcomere	• Actin and myosin form sarcomere	• Actin and myosin not organised into sarcomere therefore, they appear homogeneous rather than striated.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

SKELETAL MUSCLE

- One of the following is a common feature of cardiac muscle fibers and skeletal muscle fibers = Transverse striations
  - It also comes as with different options:
    - Similarity between skeletal muscle and cardiac muscle is = Contains T tubule
- Upon stimulation of skeletal muscles, calcium is immediately made available for binding = Troponin-C
- Protein important for skeletal muscle contraction but not for smooth muscle = Troponin
- Which of the following protein is utilized by the skeletal muscle in relaxation = Tropomyosin

- ❖ The substance which acts as oxygen binding protein in skeletal muscle is = Myoglobin
- ❖ Energy in excess of resting during contraction of skeletal muscle is called = Initial heat

CARDIAC MUSCLE

- ❖ Cardiac muscle cannot be tetanized due to = Long refractory period
  - o It also comes as
    - ▪ The property of cardiac muscle that prevents tetanization is = Prolonged refractory period
    - ▪ A feature specific for cardiac muscle as compared to skeletal muscle is = Never get tetanized
- ❖ The cardiac muscle acts as a functional syncytium because between adjacent cardiac cells there are = Gap junctions
- ❖ Increased calcium in plasma = Makes cardiac muscles excited
- ❖ One of the major factors that controls the force of heart contraction is = Initial length (preload) of cardiac muscle fibers
- ❖ Striated muscle that contracts myogenically is = Cardiac muscle
  - o It is also asked as
    - ▪ Which striated muscle rhythmically and myogenically contracts in a synchronized fashion= Cardiac muscle
- ❖ The tissue exhibiting cross striation, peripheral nuclei, and an abundance of glycogen = Cardiac muscle
- ❖ In basal state, source of energy for cardiac muscle is = Fatty acids

SMOOTH MUSCLE

- ❖ The major difference between cardiac and smooth muscle is = Nature of contractile protein
- ❖ Regarding smooth muscle fibers, which is most appropriate = Mononucleated
- ❖ Regarding Smooth muscle, which is true = Sustained and slow contraction
- ❖ Smooth muscle contraction is initiated by Ca binding to = Calmodulin
- ❖ Smooth muscle differs from striated muscle in that = Its calcium binds to calmodulin
- ❖ Which of the following proteins is a contractile protein found in both skeletal and smooth muscle= Myosin
  - o In paper both actin and myosin were given in options, prefer Myosin as it is the primary motor protein

ALSO REMEMBER THESE MCQ'S

- ❖ Pericytes provide support to smooth muscle of which structure= Blood vessels
- ❖ Regarding multi-unit smooth muscle= Tonic contractions
- ❖ The slow waves in small intestinal smooth muscle cells are= Oscillating resting membrane potentials
- ❖ Regarding smooth muscles in GIT=Has layers of circular and longitudinal muscle
- ❖ Diazepam relaxed skeletal muscle by acting on=Internuncial neurons
- ❖ Regarding general visceral efferent= Supply to smooth muscle and glands
- ❖ Which organ has three layers of smooth muscles=Fundus of stomach
- ❖ Skeletal muscle attached to bone via=Tendon

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36. A STRIATED MUSCLE THAT RHYTHMICALLY MYOGENICALLY CONTRACTS IN A SYNCHRONIZED FASHION IS= CARDIAC MUSCLE

ALSO NOTE THAT

- ❖ The tissue having the maximum arteriovenous oxygen concentration difference during resting condition is=Cardiac muscle
- ❖ Which of the following organ has highest Arteriovenous oxygen difference mL/L at rest= Heart.
- ❖ Cardiac muscle is most likely = Supplied by autonomic nerve fibers
- ❖ Cardiac muscle receives blood supply from arteries directly arising from = The pulmonary trunk

37. WHICH OF THE FOLLOWING IS LEAST AFFECTED BY BLOOD LOSS IS=SKELETAL MUSCLE

SOME OTHER IMPORTANT MCQs RELATED TO MUSCLES

- Skeletal muscle fibers are anchored to bone by = Tendon
- Regarding skeletal muscles = Belly is fleshy throughout its length
    - This comes with different options
        - Skeletal muscles most likely = Have numerous nuclei arranged at the periphery
        - Skeletal muscle most likely = Innervated by somatic nervous system
- A patient bleeding after RTA takes 8 hours to reach the hospital from the periphery. Which of the following will be least affected from ischemia = Skeletal muscle
    - It also comes as:
        - A 20-year-old man is involved in a motor vehicle accident which results in multiple blunt trauma and lacerations to his lower extremities. The left femoral artery is lacerated, and he incurs extensive blood loss and remains hypotensive for hours during transport to the emergency department. On admission, his hematocrit is 12%. Which of the following tissues is most likely to withstand the impact of these events with the least damage = Skeletal muscle
- The metabolic response of skeletal muscle in trauma is = Increase proteolysis
    - It also comes as:
        - During metabolic crises, skeletal muscle responds by = Increase protein lysis
- Which of the following causes rigor mortis in skeletal muscle = A decrease in ATP

KNOW THE DIFFERENCE

- In certain pathological conditions, a sudden stretch of a skeletal muscle will result in sustained rhythmic contractions. This phenomenon is referred to as= Clonus
- A 20-year-old female brought to emergency department with symptoms of excitable nervous system. She had seizures and peripheral skeletal muscle contraction. On blood investigation her blood calcium level was found to be 6mg/dl, blood glucose level 120mg/dl, plasma cortical level 15µg/dl. The most likely diagnosis is= Tetany

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38. THE PORTION OF MYOFIBRIL BETWEEN TWO SUCCESSIVE Z DISC IS CALLED= SARCOMERE.

ABOUT SARCOMERE AND SKELETAL MUSCLE CONTRACTION

- The portion of myofibril between two successive Z disc is called sarcomere.
- A sarcomere is the basic unit of contraction in skeletal and cardiac muscle cells.
- Structure of sarcomere
    - Thin filaments (actin filaments): Actin filaments contain binding sites for myosin heads
    - Thick filaments (myosin filaments): Myosin has head regions that can bind to actin filaments and generate force.
    - M-line: The M-line is a thin line in the middle of the sarcomere that helps to hold the thick filaments together.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

SARCOMERE

- Each sarcomere of human skeletal muscle is located between two = Z discs
    - It also comes as:
        - Sarcomere is present between = Z-Z discs
        - The structure present between two Z lines is = Sarcomere
        - Each sarcomere of human skeletal (striated) muscle is a myofibrillar unit most likely between two = Z discs
- Property of skeletal muscle seen under light microscope with low magnification = Dark and light bands

- ❖ A patient after leg fracture got cast over his leg for the past 2 weeks presents now with a strange observation that the size of gastrocnemius muscle of that side has been decreased. What could likely be the cause = Temporary decrease of actin and myosin
- ❖ The largest molecular weight protein is = Myosin

39. DURING CONTRACTION, WHICH OF THE FOLLOWING DECREASES= H ZONE AND I BAND

REMEMBER ABOUT SKELETAL MUSCLE CONTRACTION

- ➢ Steps in Excitation–Contraction Coupling in Skeletal Muscle:
    - o Action Potential Initiation: Depolarization of muscle cell membrane and T-tubules.
    - o Ca2+ Release: T-tubule depolarization triggers Ca2+ release from sarcoplasmic reticulum (SR).
    - o Ca2+ Binding: Ca2+ binds to troponin C, moving tropomyosin and exposing myosin-binding sites.

- ➢ Cross-Bridge Cycle:
    - o Myosin-Actin Binding-- Myosin head binds to actin (ADP + Pi attached).
    - o Power Stroke --- Myosin head pivots, ATP hydrolysis occurs.
    - o Cross-Bridge Detachment ---- ATP binds to myosin, detaching it from actin.
    - o Myosin Re-cocking ---- ATP hydrolyzed to ADP + Pi, myosin head repositions.
    - o Cycle Repeats -----Continues as long as Ca2+ is bound to troponin C.
    - o Relaxation ---- Ca2+ is re-accumulated by SR via SERCA; tropomyosin re-covers actin sites.

- ➢ Contraction Effects:
    - o A Band: No change.
    - o I Band and H Zone: Shortens.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- ❖ The condition essential for initiation of contraction in skeletal muscles is = Membrane depolarization
- ❖ The initiation of an action potential in skeletal muscle by stimulating its motor nerve = Requires the release of acetylcholine
- ❖ Upon stimulation of skeletal muscles, calcium is immediately made available for binding to = Troponin C
- ❖ In the relaxation phase of skeletal muscle = Ca++ return to SER
- ❖ The portion of muscle that doesn't change in length during muscle contraction is = A band
    - o It also comes as
        - ▪ During sarcomere unit contraction, width of which of the following remain constant = A band
- ❖ During contraction, which of the following decreases = H zone and I band
- ❖ Actin binds to the Z line by = Actinin
- ❖ A cross-section through the H-zone of a relaxed sarcomere would exhibit= Thick filaments
- ❖ In full contraction of skeletal muscle, the following change takes place = Two Z discs touches the edges of myosin filaments
- ❖ Which of the following muscle proteins plays an important role in power stroke of skeletal muscle = Myosin
- ❖ At rest, active sites on actin filaments are physically covered by = Tropomyosin
    - o It also comes as
        - ▪ In the resting stage, the binding sites of actin fibers are covered by = Tropomyosin
- ❖ Cross-bridge of sarcomere in skeletal muscle are made up of = Myosin
- ❖ Rigor mortis is caused by = Failure of separation of myosin cross bridges
    - o It also comes as
        - ▪ Cause of stiffness and rigidity in dead body = Failure of separation of myosin cross bridges
- ❖ Note this too
    - o Cardiac muscles contract upon = Shortening of I band

40. THE PERMANENT CELLS OR NON-REPLICATORS ARE= MYOCARDIAL CELLS

NOTE:

- Cell types can be classified into three different groups based on their capacities to divide.
- **Labile cells**
    - These are cells that are continuously dividing as part of their normal homeostatic function. Most Affected by chemotherapy
    - Examples: Bone marrow, gut epithelium, skin, hair follicles, germ cells.
- **Stable cells**
    - These cells do not usually divide under homeostatic conditions but can do so after injury
    - Examples: Hepatocytes, lymphocytes, PCT, periosteal cells
- **Permanent cells**
    - These are cells that are unable to divide, even after an injury.
    - Examples: Neurons, skeletal and cardiac muscle, RBCs.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- The replacement of dead cells cannot occur by regeneration in tissues composed of= Permanent cells
- Permanent cells are found in=Myocardial cells
- According to the potential regenerative ability the mammalian cells most likely are= The covering epithelia and blood cells are labile cells
    - It also comes as
        - The covering epithelia and blood cells are = labile cells
- Olfactory nerve cells repair or change in every 2 weeks due to=Basal cells

41. SYNAPSES ARE MOST LIKELY ABSENT IN= DORSAL ROOT GANGLION

REMEMBER ALL MCQS ABOUT SYNAPSES THAT HAVE COME SO FAR

SYNAPTIC MECHANISMS

- Which of the following will happen on the excitatory synapse = Cation influx on post synaptically through ligand-gated channels.
- The release of neurotransmitter at a chemical synapse in the central nervous system is dependent upon = Influx of calcium into the presynaptic terminal.
- In the CNS = Most neurons have synapses for more than one neurotransmitter.

SENSORY PATHWAYS AND REFLEXES

- Unmyelinated nociceptive primary afferent fibers synapse directly to one of the following neurons in the spinal cord = Spinothalamic neurons in lamina I.
- Greater splanchnic nerve synapses in = Coeliac ganglion.
- A man while working accidentally lands his foot on a pointed object and immediately removed it. Which of the following is involved in withdrawal reflex = Multisynaptic response.
- Nerve conducting one sensation modality at a time. This is called = Labelled Line Principle.
- Under microscope, which cells show many dendritic synapses = Cerebellar cortex.
    - Purkinje cell bodies are shaped like a flask and have many threadlike extensions called dendrites.
    - These are efferent fibers from cerebellar corte

CARDIOVASCULAR

42. **WHICH OF THE FOLLOWING HAS THE MAXIMUM CROSS SECTIONAL AND SURFACE AREA=CAPILLARIES**

REMEMBER

Arteries	❖ Arteries are formed by three layers o Outer tunica adventitia o Middle tunica media o Inner tunica intima ❖ Are thick walled, under high pressure, Deliver oxygenated blood to the tissues
Arterioles	❖ Are the smallest branches of the arteries ❖ Are the site of highest resistance in the cardiovascular system ❖ Arteriolar resistance is regulated by the autonomic nervous system (ANS). ❖ α1 - Adrenergic receptors are found on the arterioles of the skin, splanchnic, an renal circulations. ❖ β2 - Adrenergic receptors are found on arterioles of skeletal muscle
Capillaries	❖ Smallest blood vessel that connect arterioles and venules ❖ Have the largest total cross-sectional and surface area. ❖ Are thin walled and site of exchange of nutrients, water, and gases
Venules	❖ Are formed from merged capillaries.
Veins	❖ Carry blood towards heart. ❖ Contain the highest proportion of blood in the cardiovascular system. ❖ The blood volume contained in the veins is called the unstressed volume. ❖ Have α1-adrenergic receptors.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

ARTERIES AND AORTA

- The layers of an artery from inner to outer are = Tunica intima, media, and adventitia
- The blood vessel that contains the most elastic fibers in the tunica media is = Aorta

CAPILLARIES

- One of the following has the highest total cross-sectional area in the body: = Capillaries
- Continuous capillaries are present in = Brain
- Common characteristic of pulmonary and skeletal capillaries = Protein permeability
- One of the following factors increases the interstitial fluid pressure = Increased permeability of capillaries
- Spread of tumor to lymph nodes first is via = Capillaries

ARTERIOLES

- A patient is a known case of chronic hypertension with decreased visual acuity, the most likely affected area is = Arterioles
  - It also comes as
    - An HTN man presented with eye problems and was diagnosed as grade III HTN retinopathy. Which of the following is the target of HTN in retina = Arterioles
    - The most important target of hypertension in retina are = Arterioles

- The evidence that the arterioles offer more resistance to blood flow than other blood vessels is = The pressure drop across them is greater than that across other vessel
    - It also comes as
        - The greatest pressure drop in the circulation occurs across the arterioles because: = They have the greatest resistance
- Autonomic sympathetic nervous system mainly involves = Arterioles
- The maximum pressure from systole falls at = Arterioles-capillaries junction

VENULES AND VEINS

- The greatest percentage of blood volume is found in the = Venules and veins
- In response to compensation of hemorrhage, what will decrease = Venous capacitance
- Venous portal capillary system is formed by = 2 venules
- The vascular smooth muscle of the circulatory structure which is controlled almost exclusively by the nervous system is = Venules
- The maximum volume reduction after 8% blood loss occurs in = Veins
    - It also comes as
        - 8% blood lost in 30 minutes. Maximum loss of blood is from = Veins
- Inflammatory cells reach the site by = post-capillary venules
    - It also comes as
        - Fluid exudation and neutrophils emigration in acute inflammation occurs predominantly from = Venules

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43. PULSE PRESSURE INCREASES WITH= INCREASE STROKE VOLUME

NOTE THE MAIN VARIABLES RELATED TO HEART

Pulse Pressure	❖ Is equal to = Systolic pressure – diastolic pressure ❖ Normal Pulse pressure= 40 mm Hg (120 – 80 = 40). ❖ Pulse pressure is directly proportional to SV, ❖ Inversely proportional to arterial compliance. ❖ The most important determinant of pulse pressure is stroke volume. ❖ Increase in Pulse pressure—examples: old age, Hyperthyroidism, Aortic regurgitation ❖ Decrease in Pulse pressure –examples: Aortic stenosis, cardiogenic shock, cardiac tamponade, and HF
Mean Arterial Pressure	❖ MAP = 2/3rd diastolic pressure + 1/3rd systolic pressure OR ❖ MAP is also calculated as ○ = Diastolic pressure + 1/3 of pulse pressure ○ =80 + 40/3 = 93.3 mm Hg OR ❖ Mean arterial pressure (MAP) = CO × total peripheral resistance (TPR)
Cardiac Output	❖ CO = stroke volume (SV) × heart rate (HR) ❖ in Exercise: ○ During the early stages of exercise, CO is maintained by ↑HR and ↑SV. ○ During the late stages of exercise, CO is maintained by ↑ HR only
Stroke Volume	❖ Is the volume ejected from the ventricle on each beat ❖ is expressed by the following equation: ○ Stroke volume = End-diastolic volume – End-systolic volume Or ○ Cardiac output / Heart Rate = Stroke Volume ❖ ↑ **SV** with (mnemonic **SV CAP**) ○ ↑ Contractility (e.g., anxiety, exercise)

	○ ↓ Afterload ○ ↑ Preload (e.g., early pregnancy)
Preload	❖ Is end-diastolic volume (EDV), which is related to right atrial pressure ❖ Depends on venous tone and circulating blood volume. ❖ Frank-Starling law--- The law states that the stroke volume of the heart increases in response to an increase in the volume of blood in the ventricles, before contraction (the end diastolic volume), when all other factors remain constant more the preload, more will be CO.
Afterload / resistance against flow of left ventricle.	❖ Afterload approximated by MAP. ❖ ↑ Afterload → ↑ pressure → ↑wall tension per Laplace's law. ❖ Chronic hypertension ○ LV compensates for ↑ afterload by thickening (hypertrophy) in order to ↓ wall tension.

NOWLET'S DISCUSS SOME PAPER MCQ'S

CARDIAC OUTPUT

- ❖ The cardiac output depends mainly upon = Venous return
- ❖ During heavy exercise, cardiac output is augmented by = Increase in ventricular contractility
- ❖ There is a marked increase in cardiac output due to = Exercise performing
- ❖ The Cardiac output of the right side of the heart is what percentage of the cardiac output of the left side of the heart=100%
- ❖ Measurement of Cardiac Output:
  - ○ The measurement of cardiac output by thermodilution = Is the integral of temperature change over time
  - ○ Dye used during Indicator Dilution Method to measure cardiac output = Cardio Green
  - ○ Cardiac output measure by dye dilution method and dye should be measure in = Aorta
- ❖ Cardiac output will decrease in one of the following conditions = Cardiac failure
- ❖ If a patient shows a low cardiac output, he is most likely to have = Obstruction of inferior vena cava
- ❖ When low dose Thiazide diuretic is given to a cardiac patient, what should be considered = Decrease cardiac output
- ❖ The highest cardiac output is recorded in = Beriberi
  - ○ It also comes as
    - ▪ High cardiac output failure is caused by a deficiency of = Thiamine
    - ▪ Also Note:
    - ▪ Sustained increase in cardiac output is seen in = Anemia
- ❖ Which muscle of mastication involved in yawning increases cardiac output = Lateral pterygoid
- ❖ Pharmacological Influence:
  - ○ A 25-year-old lady with bradycardia, decreased cardiac output, pale skin, and increased peripheral vascular resistance is likely using = Phenylephrine
  - ○ Propranolol is administered to reduce cardiac output. The receptor most likely blocked is = Beta 1 receptors
- ❖ Autoregulation of renal blood flow occurs at which mean arterial pressure range = 80-120 mmHg
- ❖ Keeping end diastolic length constant, how can the cardiac output be increased=By increasing heart rate
- ❖ A person had blood loss which caused a decrease in mean arterial pressure from 100 to 70 mmHg. The most likely change would be = Increased cardiac sympathetic efferent activity
- ❖ The cardiac reserve = Is the maximum percentage by which the cardiac output can be increased above normal

STROKE VOLUME

- ❖ Cardiac output when divided by heart rate equals = Stroke volume
- ❖ Stroke volume = Is a determinant of cardiac output
- ❖ Starling's law of the heart: = Explains the increase in cardiac output when venous return increases

- It also comes as
    - Stroke volume increases by = Increase in EDV
- Hemorrhagic shock in an adult after two liters of blood loss shows = Decreased stroke volume
- **DURING** extra systole which of the following occurs=Pulse pressure decreases due to decrease in stroke volume
    - It also comes as **AFTER** extra systole
        - An ECG shows ventricular extra systole. The next normal ventricular contraction that occur after extra systole would produce= Increase pulse pressure due to increases in contractility of ventricle
- Stroke volume increased but neither TPR nor diastolic pressure increased. What will be the effect= pulse pressure & mean arterial pressures raised
    - It also comes as
        - Increase in stroke volume with unchanged peripheral resistance and capacitance result in=Increase in pulse pressure with increase in MAP
- Extra systolic beat= Decrease pulse pressure due to decrease stroke volume
- During rest, in a well-trained athlete, there is increase in=Stroke volume (SV > Cardiac output)
    - Know this ---Trained athletes===Dec HR but SV and cardiac output is increased
    - It also comes as
        - A person with HR 42 and stroke volume 110ml. Diagnosis? = Professional athlete
        - An athlete's heart differs from a non-athlete's by = Increased stroke volume and decreased heart rate
- Feature of Hypertrophic Obstructive Cardiomyopathy (HOCM) = Decreased stroke volume and impaired diastolic filling

PULSE PRESSURE

- Pulse Pressure= difference between Systolic and Diastolic BP
- Pulse pressure increased by= maximum resistance in arteries then aorta
- Regarding pulse pressure it is decrease in= decrease in systemic pressure
- Pulse wave velocity can be used to= Detect blood flow to the extremity
- Pulse pressure increases in which condition= Thyrotoxicosis
- Cause of increase pulse pressure=Increase Stroke volume
    - It also comes as
        - Which of the following is the cause of increase pulse pressure= Increase Stroke volume
        - Acute increase in pulse pressure is due to= Increased stroke volume
- Increase in stroke volume with unchanged peripheral resistance and capacitance result in= Increase in pulse pressure with increase in MAP

MEAN ARTERIAL PRESSURE (MAP)

- Mean arterial pressure is=CO x TPR
    - It also comes as
        - Mean arterial pressure (MAP) is calculated by= Diastolic pressure + 1/3 pulse pressure
- Increasing SV, while keeping TPR, Diastolic Pressure normal. What will happen= Inc MAP
- Blood flow to tissues is maintained by= Mean arterial pressure
    - It also comes as
        - The main circulatory drive of blood flow is= MAP
        - The main driving force for delivery of blood to tissue is= Mean arterial pressure (MAP)
- If heart, after pumping were to be stopped to ensure that circulatory system becomes static, the pressure measured in rest of the body is= Mean systemic filling pressure

AFTERLOAD AND PRELOAD:

- Best index of afterload = Total peripheral resistance
    - It also comes with different options

        - The best index of afterload is = Blood Pressure
- The best index of preload is = Left ventricular end diastolic volume
- After climbing stairs rapidly, cardiac output increased by 50%, likely due to = Increased preload
- A person took stairs to 4th floor. Increase in cardiac output will be due to = Increase preload

VENOUS RETURN

- Venous return is directly proportional to = Mean systemic filling pressure
    - It also comes as
        - Mean systemic filling pressure primarily regulates = Venous return
- Small veins that usually accompany arteries and play a role in venous return are = Venae comitantes
- Major determinant of diastolic BP is = Venous return
- Regarding venous return, which is correct = Increased in inspiration
    - It also comes as
        - During inspiration = The venous return to the heart is increased
        - Adding positive end-expiratory pressure to ventilated patients results in = Raised pressure during the expiratory phase reduces the venous return
        - Venous return to the heart is decreased by = Paralysis of skeletal muscles
- In a man performing exercise, venous return from legs is facilitated mainly by = Contraction of leg muscles
- A young girl has BP 90/70 and pulse 100 in the supine position, and her pulse increases to 120 when standing. This is due to = Decreased venous return to the heart
    - It also comes as
        - Heart rate increases when a person stands from sitting due to = Decreased venous return
        - When a person moves from a supine to the standing position, the most likely compensatory change is = Increase heart rate
- Increase in venous return does NOT result in an increase in one of the following = Pulmonary pressure
- Systolic arterial pressure is = Affected by the venous return to the heart
- In the steady state, one of the following set of flows is equal = Venous return and pulmonary blood flow

44. THE P WAVE OF NORMAL ECG IS ASSOCIATED WITH= ATRIAL DEPOLARIZATION

ABOUT ECG

- P wave — Atrial depolarization
- PR segment --- AV nodal delay
- QRS complex ---- Ventricular depolarization (simultaneously atrial repolarization simultaneously)
- ST segment ----- Time during which ventricles are contracting and emptying.
- T wave --- Ventricular repolarization
- TP Interval --- Time during which ventricles are relaxing and filling

NOW LET'S DISCUSS SOME PAPER MCQ'S.

P WAVE AND PR INTERVAL

- The P wave of normal ECG is associated with= Atrial depolarization
- What segment of ECG coincide with a-wave of JVP=PR segment
- Relaxation of ventricles (ventricle filling) is represented in ECG by=TP segment
- Atrial Extra systole beat on ECG= AV nodal delay
- PR interval on ECG denotes= AV node delay
    - It also comes as
        - PR interval on ECG shows= Time taken from atrial depolarization to ventricular depolarization start
        - Time of ECG starting from atrial depolarization to ventricular systole is= PR interval
- In which of the following conditions, atrial repolarization is evident on ECG=3rd degree heart block

- AV node delay on ECG is associated with = PR interval.
  - It also comes as
    - When AV conduction velocity is slowed down, what will be seen= Increased PR interval
    - Decreased Av nodal conduction velocity is represented on ECG as= Prolong PR interval
    - PR interval increases with = Decrease AV nodal conduction
- Regarding parasympathetic stimulation, which is correct= Increase PR interval
- Absent P waves on ECG occurs in=Nodal rhythm
  - It also comes as
    - Absent P wave on ECG, which one of the following is not shown on ECG=Atrial systole
- Know the difference in these two MCQs:
  - The part of the ECG from the END of the P wave to the start of the QRS complex= PR Segment
  - The part of the ECG from the START of the P wave to the start of the QRS complex= PR Interval

QRS COMPLEX

- Ventricle systole corresponds on ECG with= QRS
- Which of the following represents ventricular systole on ECG= QRS complex
  - Know the difference:
    - Ventricle systole corresponds on ECG with= QRS complex
    - Complete ventricular systole on ECG shown by= QT interval
- During cardiac cycle, QRS complex begins slightly prior to the onset of= Ventricular systole
- Regarding QRS complex on ECG, which is true= Occurs due to Ventricular depolarization
- QRS complex occur= At start of ventricular contraction
- Wave of depolarization passes from endocardium to Epicardium represented on ECG as= QRS complex
- Which of the following is followed by a QRS complex= Ventricular contraction
- Tall QRS complex in lead II on ECG shows which of the following=Hypertrophied ventricle
- Most important cause of low amplitude QRS complex is= Old MI
- A 56-year man working in office felt chest discomfort. On auscultation a murmur was heard and ECG shows QRS complexes of 0.18s deviated at 120 degrees. What is the likely diagnosis=RBBB

ST SEGMENT

- In a normal ECG strip ventricles are in a state of complete depolarization during= ST segment
- Plateau phase of ventricles of heart on ECG is represented by=ST segment
- Acute myocardial injury on ECG is shown by= ST elevation
- Maximum Ca influx during ventricular myocytes depolarization= ST segment
  - It also comes as
    - In which phase, there is maximum entry of Ca into myocytes= ST segment
- The most characteristic ECG finding showing acute MI is= Displacement of ST segment in the leads overlying the area of infarct
- The ECG change characteristic of acute myocardial infarction = Displacement of ST-segment

OTHERS

- The T wave of an ECG occurs= During repolarization of the ventricle
- Onset of the ventricular systole coincides with the peak of= R wave in the ECG
- The systolic phase of the cardiac cycle corresponds to one of the following portions of ECG = RT interval
- Relaxation of ventricles (ventricle filling) is represented in ECG by= TP segment
- ECG recording is during= partly depolarization partly repolarization.
  - It also comes as
    - Current flow occurs in the heart to produce waves in the ECG when the heart is= Partially depolarized and partially polarized
- Which is not graphic presentation on ECG= SA node
  - It also comes as

- Regarding myocardium, ECG does not record the following electrical activity generated normally in the= SA node

---

45. HYPOKALEMIA ON ECG IS REPRESENTED BY = U WAVE

ALSO NOTE THE CHANGES WITH ELECTROLYTES

- Hyperkalemia
  - Tall, peaked T waves
  - PR interval prolongation and disappearance of the P wave and finally
  - Degeneration of the QRS complex to a sine wave pattern and ventricular asystole or fibrillation
- Hypokalemia
  - Inverted T wave, Depressed ST segment, Prominent U wave
- QT interval
  - Short QT
    - Hypercalcemia
  - Prolong QT
    - Hypoglycemia, hypocalcemia
    - Mnemonic **ABCDE**
      - anti**A**rrhythmics (class IA, III), anti**B**iotics (eg, macrolides), anti"**C**"ychotics (eg, ziprasidone), anti**D**epressants (eg, TCAs), anti**E**metics (e.g., ondansetron)
- Note:
  - Hypokalemia and hypocalcemia will not be correct without magnesium correction.

NOW LET'S DISCUSS SOME PAPER MCQ'S.

HYPERKALEMIA:

- ECG findings of tall T waves, wide QRS complex, and absent P waves are consistent with = Hyperkalemia.
  - It also comes as
    - Tall T waves with wide QRS complex and absent P waves. Diagnosis = Hyperkalemia.
- A person has multiple blood transfusions during surgery. He develops an irregular rhythm, and ECG shows tall T-waves. Diagnosis = Hyperkalemia.
  - It also comes as
    - For a transfusion, the blood was warmed at 37°C, after which ECG showed tall, peaked T wave. This is likely due to which component in the transfusion = Hyperkalemia.
- The ECG finding of a patient taking K sparing diuretics is = Tall T waves.
  - It also comes as
    - Patient is taking K sparing diuretics and beta blockers. The change seen on ECG is = Tall T waves.
    - A 60-year-old woman presents to the emergency department with generalized weakness. The patient is a known hypertensive with a treatment history of potassium-sparing diuretics and ACE inhibitor. Laboratory investigations reveal high serum creatinine and high BUN (blood urea nitrogen). Her ECG shows tall, peaked T-waves. Which one of the following electrolyte disturbances should be corrected to return the ECG to normal = Hyperkalemia.

HYPOKALEMIA:

- In the myocardium, hypokalemia produces= U-wave in ECG.
  - It also comes as
    - U wave on ECG is seen in = Hypokalemia.
    - The most prominent feature of hypokalemia on ECG is = U wave.
    - ECG of a patient in ER shows prolonged PR interval, inverted T waves with prominent U waves. What is the abnormality = Hypokalemia.
- Pt comes to ER with complaints of heart sinking. ECG shows low T waves. Diagnosis = Hypokalemia.

  - It also comes as
    - A patient with complaints of muscular weakness, constipation, and sinking of heart. On ECG, there is decreased amplitude of T waves. What is the cause = Hypokalemia.
    - Patient feels weakness, and his heart sinking down. On ECG, there is decreased amplitude of T waves. Cause is = Hypokalemia and hypocalcemia.
    - ECG of a patient with sinking of heart in ER shows prolonged PR interval, inverted T waves with prominent U waves. What is the abnormality = Hypokalemia.
- The U wave in the ECG is due to = Slow repolarization of the papillary muscles.
- In ECG, depressed T wave due to = Hypokalemia.

OTHERS

- ECG changes in hypoglycemia = Increase QT Interval.
- A direct consequence of severe magnesium deficiency would be = Hypokalemia.
- ECG feature is most characteristic of hypercalcemia= Shortened QT interval

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46. INCREASED "A" WAVE IN JVP DUE TO = TRICUSPID STENOSIS.

ABOUT JUGULAR VENOUS CURVE

- a wave—atrial contraction. Absent in atrial fibrillation.
- c wave—RV contraction (closed tricuspid valve bulging into atrium).
- x descent—atrial relaxation and downward displacement of closed tricuspid valve during ventricular contraction. Absent in tricuspid regurgitation.
- v wave—Inc. right atrial pressure due to filling ("villing") against closed tricuspid valve.
- y descent—RA emptying into RV.
- **Pathologies:**
  - *a wave* → Absent in atrial fibrillation, mitral stenosis
  - Giant "a" wave → Tricuspid Stenosis
  - Giant "v" wave → Tricuspid Regurgitation
  - x descent → Absent in tricuspid regurgitation
  - y descent → Prominent in constrictive pericarditis, absent in cardiac tamponade.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- C wave in JVP corresponds to = Right ventricular contraction
  - It also comes as
    - The C wave in JVP coincides with = Ventricular contraction
    - C wave shows = Bulging of tricuspid valve
- Which JVP wave will be absent in mitral stenosis = A wave
  - It also comes as
    - A patient of mitral stenosis has presented with irregular pulse. The wave which will be absent on Jugular venous pulse examination would be = "a" wave
- Giant "a" wave in cardiac cycle with right ventricular hypertrophy in = Tricuspid stenosis
  - It also comes as
    - Large A wave = Tricuspid stenosis
- V wave represents nearly = Isovolumetric relaxation
  - It also comes as
    - During cardiac cycle recording, monitor will show "v" wave of atrial pressure occurring in = Isovolumic relaxation phase
- JVP appears on which pressure = 15 mmHg
- Dicrotic notch in JVP is due to = Closure of aortic valve
- During inspiration, JVP drops due to = Increase venous return
- Increase JVP due to increase in = Resistance

47. **ECG, - P WAVE IS REPLACED BY IRREGULAR WAVES, QRS IS PRESENT IRREGULARLY, RHYTHM IS IRREGULARLY IRREGULAR, WHAT CAN BE POSSIBLE DX= ATRIAL FIBRILLATION**

ECG ABNORMALITIES

<table>
<tr><td>Atrial fibrillation</td><td>❖ No P waves.
❖ irregularly spaced QRS complex</td></tr>
<tr><td>Atrial flutter</td><td>❖ Back-to-back atrial depolarization wave
❖ Resulting in saw-tooth appearance
❖ treatment: catheter ablation</td></tr>
<tr><td>Ventricular fibrillation</td><td>❖ Erratic rhythm with no identifiable waves
❖ fatal without immediate CPR and defibrillation</td></tr>
<tr><td>1st degree heart block</td><td>❖ The PR interval is prolonged (> 200 mSec).</td></tr>
<tr><td>2nd degree heart block</td><td>❖ In this condition dropped beats occur because some impulses from the atria fail to conduct to the ventricles.
❖ It is of two types----Mobitz type-I and Mobitz type II
<table>
<tr><th>Type</th><th>Mobitz type- I (aka Wenckebach phenomenon)</th><th>Mobitz type II</th></tr>
<tr><td>Definition</td><td>It is characterized by progressive lengthening of PR interval until a dropped beat occurs, and the cycle is repeated</td><td>It is characterized by a dropped beat without progressive lengthening of PR interval. May progress to 3rd-degree block.</td></tr>
</table></td></tr>
<tr><td>3rd degree (complete)</td><td>❖ It is characterized by no conduction through the atrioventricular node (AVN) so the atria and ventricles beat independently
❖ Both P waves and QRS complexes are present.
❖ Although the P waves bear no relation to the QRS complexes.
❖ Atrial rate is faster than ventricular rate.
❖ Canon A waves (visible in neck due to large volume pulse from compensatory increase)</td></tr>
<tr><td>Wolff-Parkinson-White syndrome</td><td>❖ Most common type of ventricular preexcitation syndrome.
❖ Abnormal fast accessory conduction pathway from atria to ventricle bypasses the rate-slowing AV node
❖ Characteristic delta wave with widened QRS complex and shortened PR interval on ECG</td></tr>
<tr><td>Bifascicular block</td><td>❖ Is the combination of RBBB and left bundle hemiblock, manifest as an axis deviation, eg LAD in the case of left anterior hemiblock.</td></tr>
<tr><td>Trifascicular block</td><td>❖ Is the combination of bifascicular block and 1st degree heart Block.</td></tr>
</table>

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

ATRIAL FIBRILLATION

- ❖ Atrial Fibrillation leads to = Embolus
    - o It may also be asked as
        - ▪ The most likely cause of ischemic stroke in a patient with atrial fibrillation is = Embolic
        - ▪ - The most likely cause of stroke in patients with atrial fibrillation is = Embolism
- ❖ Patient has mitral stenosis develops Atrial fibrillation. Most suitable finding = Irregular R-R interval
    - o It may also be asked as

    - An irregularly irregular pulse on ECG with many abrupt P waves and irregular QRS complexes indicates = Atrial fibrillation
    - Absent P waves and irregular R-R interval on ECG occurs in = Atrial fibrillation
    - A 25-year-old man diagnosed to have mitral stenosis presents in the clinic with palpitation. His ECG shows atrial fibrillation. The finding which supports atrial fibrillation most is = Irregular R-R interval
    - Which of the following finding on ECG supports the diagnosis of atrial fibrillation = Irregular R-R interval

- A female pregnant with mitral stenosis came to you with atrial fibrillation. What will you do = IV heparin
  - It also comes as
    - A pregnant lady presents with mitral stenosis. To prevent atrial fibrillation-related complications, which treatment should be given = Intravenous heparin
- A female known case of thyrotoxicosis presented in ER with heart rate 180 b/min and ECG shows irregular RR. Drug of choice will be = Beta blocker

ATRIAL FLUTTER

- Saw tooth appearance on ECG = Atrial flutter
  - It also comes as
    - On ECG of a girl, you see saw tooth waves, with P waves in a ratio of 3:1. Her pulse is regularly irregular. Which of the following has occurred = Atrial flutter
    - Saw tooth appearance on ECG with QRS complex after every 3 P waves. The likely diagnosis is = Atrial flutter
- During atrial flutter, the heart rate is usually between 200 to 350 beats/min

HEART BLOCK

- A known HTN patient taking a beta blocker came for a regular checkup. ECG showed prolonged PR interval. The likely cause is = Drug-induced 1st-degree block
  - It may also be asked as
    - ECG shows prolonged PR interval with no missed beats. Diagnosis = First degree heart block
- The ECG of a person shows progressive prolongation of PR interval in successive heartbeats followed by a dropped beat. The person is most likely to have = Mobitz I block
- ECG of a pt. shows 3:1 ratio of P to QRS. Diagnosis = Mobitz 2
  - It may also be asked as
    - Electrocardiogram of a patient shows prolonged PR interval and QRS complexes after every three P waves (3:1 rhythm). He is most likely having AV heart block of the type = Mobitz II 2nd degree heart block
    - In ventricular ECG, changes appeared and ventricular beat slower than atria. Diagnosis = Second-degree heart block would most likely result in = Ventricular rate is lower than the atrial rate
- Atrial repolarization in ECG = 3rd degree block
  - It may also be asked as
    - In which of the following conditions, atrial repolarization is evident on ECG = complete heart block
- 3rd degree block occurs due to = AV node block
- A patient with a history of fainting episodes. ECG shows complete dissociation between P wave and QRS complex. The diagnosis is = 3rd-degree block
- In complete heart block = Fainting may occur because of prolonged periods in which ventricles fail to contract

ARRHYTHMIAS

- A 70-year-old patient brought to the ER in critical condition with SA rate >350 bpm and AV rate 135-150 bpm. Diagnosis = Ventricular tachycardia

- A woman usually feels tachycardia during exercise and stress which settles down with rest. Diagnosis = Sinus tachycardia
- Patient comes with SVT, which should be given = Verapamil (if adenosine is an option, prefer that)
- A 60-year-old male admitted in medical ward with ischemic heart disease complains of palpitation, dyspnea, sinking of heart, and syncope. ECG shows abnormal QRS Complex with rate between 140 and 200 per minute. The best treatment option will be = Lidocaine (if ischemic heart disease, prefer Lidocaine > Amiodarone)
- Which of the following drug is used to prevent tachy-dysrhythmias in a patient with Wolf Parkinson White syndrome = Droperidol (no other relevant option)
- Left axis deviation on ECG in = Right ventricular tissue damage
- Absent P waves on ECG occurs in = Nodal rhythm
- Re-entry circuit seen in = Paroxysmal nodal tachycardia
    - Note: Re-entry circuit is present in many supraventricular arrhythmias, but the best option among all is paroxysmal nodal tachycardia

OTHERS

- Man, with ECG of prolonged PR interval, left axis deviation and no left hypertrophy. Diagnosis = Trifascicular block
- Increasing vagal stimulation of the heart will cause an increase in = PR interval
- The effect of carotid massage on an ECG presentation of SVT = PR interval

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48. IF ABSENT P WAVE AND NORMAL QRS COMPLEX AND T WAVE, WHERE ~~IS THE PACEMAKER= AV NODE~~

REMEMBER ABOUT PACEMAKER PLACEMENT

- P-QRS dissociation------- Pacemaker in right atrium to synchronize atria and ventricles.
- Complete heart block----Pacemaker in right ventricle to maintain ventricular contractions.
- Absent P waves, normal QRS/T ----- Rhythm from AV node acting as pacemaker.
- Bradycardia with wide QRS ---Pacemaker activity from Purkinje fibers indicating severe conduction block.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- The ECG of a patient shows P waves and QRS complex dissociation. Where should the pacemaker be placed = Right atrium
- For a patient with complete heart block, the pacemaker terminals should be placed in = Right ventricle
- If absent P wave and normal QRS complex and T wave, where is the pacemaker= AV node
- Patient present with heart rate of 25 and wide QRS complex, where is the pacemaker located=Purkinje fiber

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49. PT. COMPLAINS OF CHEST PAIN FOR MORE THAN 30 MIN. ECG SHOWS CHANGES IN V1-V4. IT DENOTES = ANTERIOR WALL MI

NOTE THE AREAS FOR MI AND THEIR ARTERY RELATIONSHIP

- Commonly Occluded Coronary Arteries= LAD > RCA > circumflex

Area Involved	ECG Leads Presentation	Artery
Septal	V1, V2	LAD
Anterior	V3, V4	LAD
Lateral leads	Lead I , avL, V5 and V6	LCX
InFerior leads	Lead II, Lead III, and avF	RCA

I Lateral	aVR	V1 Septal	V4 Anterior
II Inferior	aVL Lateral	V2 Septal	V5 Lateral
III Inferior	aVF Inferior	V3 Anterior	V6 Lateral

NOW LET'S DISCUSS SOME PAPER MCQ'S

RCA (RIGHT CORONARY ARTERY)

- ❖ A man presents to ER with ST depressions in II, III, and aVF and was advised angiography. The most likely culprit artery is = RCA
- ❖ ECG shows changes in leads II, III, and aVF. Diagnosis = Inferior wall MI
- ❖ ST segment elevation in lead II. Which artery is affected = Right main coronary
  - o It may also be asked as
    - ▪ Right hemicolectomy patient, 5mm ST elevation in lead II. Which artery involved = RCA
    - ▪ A 50-year-old male presented with acute chest pain. ECG showed ST elevation in Lead II. The culprit vessel involved = Right main coronary
    - ▪ A 50-year-old male presented with acute chest pain. ECG showed ST elevation in Lead II and complete heart block. The culprit vessel involved = RCA
- ❖ In inferior wall MI, which artery is likely to be blocked = Right marginal (CPSP Demo Key Que 122)
  - o It may also be asked as
    - ▪ Artery involved in inferior wall MI = Right marginal

LEFT ANTERIOR DESCENDING ARTERY (LAD)

- ❖ Lead V4, ST elevation indicates a problem in which artery = Left Anterior Descending Artery (LAD)
  - o It also comes as
    - ▪ ECG changes in lead V4 indicated involvement of which vessel = LAD
- ❖ Infarction of apex of the heart, vessel thrombosed = LAD
- ❖ The coronary artery most likely involved in anterior wall myocardial infarction = LAD
  - o It also comes as
    - ▪ A patient with an anterior wall infarct of the left ventricle most likely has a thrombus in = LAD

LEFT CIRCUMFLEX ARTERY (LCX)

- ❖ MI of the posterolateral surface of the heart. The vessel involved is = Left circumflex artery (LCX)
  - o It also comes as
    - ▪ Subendocardial lateral wall infarct occurs due to occlusion of = LCX
    - ▪ Posterolateral wall MI occurs due to occlusion of = LCX
    - ▪ The heart musculature most likely to be ischemic due to blockage of the circumflex branch of the left coronary artery = Posterior part of the left ventricle
- ❖ Infarct in the lower segment of the heart = LCX
- ❖ Examination of a heart reveals an old and a new area of damage caused by the occlusion of the circumflex branch of the left coronary artery. The damage is most likely in the = Left atrium and left ventricle
  - o It may also be asked as
    - ▪ The circumflex artery supplies = Left atrium and left ventricle

OTHERS

- ❖ Blood supply of heart by= Two coronary arteries, auricular, atrioventricular, septal

- Pt with increased heart rate, ECG suggestive of post-intervention infarction. Keeping in view the regular rhythm increases in HR. Where could the infarction be = Small limited area of ventricular myocardium damaged
- The most appropriate statement regarding the blood supply of the heart = The left coronary artery divides into the anterior interventricular and circumflex branches
- The arterial supply of the heart is provided by the right and left coronary arteries, which arise from the ascending aorta. Posterior ventricular branches of the right coronary artery most likely = Supply the diaphragmatic surface of the right ventricle

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50. INFARCTION INVOLVING POSTERIOR 1/3 OF INTERVENTRICULAR SEPTUM. ARTERY INVOLVED= RCA

Artery	Supplies
Left anterior descending artery (LAD)	Anterior 2/3rd of interventricular septum Anterior surface of left ventricle
Posterior descending/interventricular artery (PDA)	Posterior 1/3rd of interventricular septum
Left circumflex coronary artery (LCX)	Lateral and posterior walls of left ventricle
Sinoatrial (SA) Node Blood Supply	Right Coronary Artery: 60% of patients Left Circumflex Artery: 40% of patients
AV Node Blood Supply	Right Coronary Artery: 90% of patients Left Circumflex Artery: 10% of patients
His Bundle Blood Supply	Right Coronary Artery: main blood supply Septal Perforators of the LAD: minor contribution

KNOW THE DIFFERENCE.

- Post 1/3rd of interventricular septum supplied by= The posterior interventricular artery (branch of RCA)
- Remaining anterior 2/3 interventricular septum is supplied by= anterior interventricular artery (branch of LAD)

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

INTERVENTRICULAR SEPTUM

- Post 1/3 of the interventricular septum is damaged. The artery involved is = Right coronary artery
  - It also comes as
    - The posterior-1/3 of interventricular septum is supplied by= Posterior interventricular descending artery
    - Infarct near the posterior interventricular septum will involve blockage of which artery = RCA
    - A patient has an acute myocardial infarct involving the posterior 1/3rd of the interventricular septum. The artery most likely to be occluded is: = Right coronary
    - A patient with myocardial infarction near the posterior interventricular septum most likely has blockage in the = Right coronary artery
    - Infarction involving posterior 1/3 of interventricular septum. Artery involved= RCA
- Myocardial infarction with inferior infarct most likely affects the = Posterior interventricular artery
  - It also comes as
    - Myocardial infarction near the posterior interventricular septum is most likely caused by blockage of the = Right coronary artery
- Major blood supply of the interventricular septum is from the = Anterior interventricular artery
- Supply of AV septum mainly is from=Anterior interventricular artery
- Posterior interventricular septum is supplied by= Middle cardiac vein
- True regarding Left Coronary artery is=Gives branches that runs in anterior interventricular groove
- A patient died following severe chest pain. On autopsy, a thrombus was found in the left coronary artery. This artery commonly=Gives circumflex artery which runs in atrioventricular groove
- A defect in the interventricular septum most affects the = tricuspid valve

APEX OF HEART

- Apex of the heart is supplied by=LAD
    - Remember
        - Apex of the heart is supplied by=Anterior interventricular artery
            - LAD is also known as anterior interventricular artery
        - If asked which artery **MARGINAL** branch supplies Apex of heart= RCA
- Infarction involving apex of the heart. Artery involved= LAD

SURFACES OF HEART SUPPLY

- The anterior surface of the heart is formed by = Right ventricle
    - It is also asked as
        - The anterior (sternocostal) surface of the heart is formed mainly by the: = Right ventricle
- Occlusion of which artery leads to infarction of the anterior surface of the left ventricle = LAD
- Infarct on posterolateral surface of heart. Which artery is involved= Left circumflex
    - It is also asked as
        - If circumflex branch of left coronary artery is blocked. Which area will be
        - effected=Posterior surface of left ventricle
- The left atrium is supplied mainly by the = LCX
- LCX (Left Circumflex Artery) block area affected = Left atrium + left ventricle
- Blood supply of posterior surface of heart is by = RCA

SA NODE, A V NODE AND BUNDLE OF HIS

- 60% of SA node is supplied by=RCA
- AV Node is supplied mainly by=RCA
- If RCA gets blocked after giving Rt marginal artery, which portion of the heart will be affected=AV node
- The AV node is supplied by=RCA near interventricular groove
- With the RCA cut distal to origin of marginal the area most damaged will be=AV node
- Bundle of HIS is supplied by= RCA
- Right bundle branch (RBB) is supplied by=Left coronary artery
    - It also comes as
        - Which is not supplied by right coronary artery= Right bundle branch
- RCA after giving off the right marginal artery supplies which portion of the heart = AV node
- Posterior descending artery supplies = AV node
- The right coronary artery: = Supplies the SA node

OTHERS

- Epicardium gets its blood supply from=Coronary artery
- Septomarginal (moderator band) trabeculae traverses which part of the heart=Right ventricle
- Sinus artery is branch of=RCA

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51. WHICH VEIN IS IN POSTERIOR INTERVENTRICULAR GROVE OF HEART= MIDDLE CARDIAC VEIN

REMEMBER THE VENOUS DRAINAGE OF HEART AND VEINS FROM PAST PAPER MCQ'S

CORONARY SINUS

- Main venous drainage of heart= Coronary sinus
- How much venous drainage of the myocardium is drained by coronary sinus=2/3 of heart

GREAT CARDIAC VEIN

- At apex, in sulcus, which vein starts= Great cardiac
- Which vein accompany anterior descending artery=Great cardiac
- A surgeon is performing open heart surgery. Which vessel is running close to LAD and can be damaged= Great cardiac vein

ANTERIOR CARDIAC VEIN

- Which directly empties into right atrium of heart= Anterior cardiac vein
  - It is also asked as
    - The vessel draining directly into right atrium is=Anterior cardiac vein
- The vein accompanying the circumflex artery is the = Anterior cardiac vein

MIDDLE CARDIAC VEIN

- Vein in posterior interventricular sulcus= Middle cardiac vein
- Which of the following vein accompanying posterior interventricular artery=Middle cardiac vein

OTHER

- Regarding coronary blood flow= Decreases with Inc. heart rate
- Which is an example of coronary circulation=End to end anastomosis
- Infundibulum supplied by=Right conus artery
- Septo-marginal trabeculae (moderator band) is attached to= right ventricle
- Infundibulum present in (which part of) heart= Right ventricle

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52. CARDIAC PLEXUS= CONTAIN BOTH SYMPATHETIC AND PARASYMPATHETIC FIBERS

ALSO NOTE THESE MCQ'S

- In the superior mediastinum, the superficial cardiac plexus receives branches from = Left vagus
- The human epicardium consists of = Visceral layers of serous pericardium
- The epicardium receives its arterial blood supply from the: = Coronary arteries
- Epicardium is supplied by= coronary arteries > Pericardiophrenic artery
- Superficial cardiac plexus is made by= Left vagus
- Pericardial cavity lies between = Visceral and parietal layer of fibrous pericardium
- The fibrous pericardium together with parietal layer of serous pericardium is innervated by= Phrenic nerve
  - It is also asked as
    - Fibrous and parietal layer of pericardium supplied by= Phrenic
    - Pericarditis pain from fibrous pericardium together with the parietal layer of serous pericardium is carried by = Phrenic nerve
- Which artery is likely to be damaged in close proximity of phrenic nerve= Pericardiophrenic artery
  - It is also asked as
    - The artery which may be accidentally injured being in close vicinity of the phrenic nerve is: = Pericardiophrenic
    - The left phrenic nerve descending between mediastinal pleura and the pericardium is accompanied with = Pericardiophrenic artery

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53. A PATIENT HAS CHEST PAIN FROM 4 HOURS WHICH IS RADIATING TO HIS LEFT ARM. ECG SHOWS ST ELEVATION. WHICH CARDIAC ENZYME WILL BE RAISED=TROP I

ABOUT CARDIAC ENZYMES AND DIAGNOSIS

- Most specific=Troponin I
- CK-MB→Useful in diagnosing reinfarction following acute MI, because levels return to normal after 48 hours

	CK-MB	Troponin I	LDH	Myoglobin
4 hours		Weakly positive		
6 Hours	Weakly positive	Weakly positive		Peaks
12-16 Hours	Strongly positive	Strongly positive		Weakly positive
24 Hours	Peaks	Peaks		Weakly positive
2 Days	Persists	Persists		Negative

3 Days	Negative	Persists	Peaks	
4-7 Days		Persists	Persists	

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

CK (CREATINE KINASE)

- Pt previously had MI, now again had MI, investigation needed = CK-MB
    - It is also asked as
        - A patient previously had recent MI and now presents again with MI. The Investigation needed to confirm re-infarction is= CK-MB
- A 55-year-old male smoker presents with retrosternal severe chest pain for the last 6 hours with sweating. O/E he is overweight, pulse 90/min, BP 100/60 mmHg. ECG shows changes of anterior wall ischemia. The most useful diagnostic investigation = CK-MB
- A Patient developed retrosternal crushing pain for 2 to 3 hrs. On ECG, there was ST elevation in Ant Limb Leads. Cardiac Enzymes were normal. Diagnosis = Acute MI

TROPONIN (TROP I)

- A patient has chest pain for 4 hours which is radiating to his left arm. ECG shows ST elevation. Which cardiac enzyme will be raised = Trop I
- For monitoring heart of ischemic heart disease pt with end stage renal disease best marker is = Trop I
- Which is the most important serum marker in MI = Trop I
- A patient presented with acute chest pain for 4 hours. ECG showed ST elevation. The specific enzyme raised in blood = Trop I
- A patient presented with acute chest pain for 4 hours. ECG showed ST elevation in leads V1-V6. Specific enzyme raised in blood = Trop I > 35ng/mL
- The plasma biochemical markers which is most sensitive of myocardial cell damage is= Troponin

MYOGLOBIN

- Which of the following is raised in MI in the first hour = Myoglobin

NOTE THE DIFFERENCE.

- 55-year-old presents with chest pain at 2am in ER. Had been doing machinery work all day long. ECG normal. CK raised, CK-MB normal. Troponin normal. Pain was most probably due to = Musculoskeletal
- A patient with anterior chest pain, normal ECG, and cartilaginous changes on X-ray likely has = Costochondral injury
- A 20-year male with lumbago presents with acute chest pain. Vitally he is normal. On investigation, ECG and cardiac enzymes are normal. O/E he is tender on the 4th and 5th ribs. Diagnosis = Costochondritis
- A 20-year-old man with lumbago presented with acute left-sided chest pain. O/E BP normal, tenderness on the 4th and 5th intercostal space posteriorly, Trop-T and CKMB normal. Likely diagnosis = Costochondritis
- A Pt developed retrosternal crushing pain for 2 to 3 hrs. On ECG, there was ST elevation in Ant Limb Leads. Cardiac Enzymes were normal. Dx= Acute MI (Initially cardiac enzymes can be normal and it should be repeated, other options were not relevant in this MCQ)

54. FIRST HEARD SOUND IS PRODUCED DURING = ISOVOLUMIC CONTRACTION

ALSO REMEMBER

Heart Sound	Reason	Notes
S1	Isovolumic contraction, mitral and tricuspid valve closure	S1 is longer than S2 While Low frequency, low intensity compared to S2

S2	Isovolumic relaxation, aortic and pulmonary valve closure	Inspiration delays closure of the pulmonic valve and thus causes splitting of the second heart sound.
S3	Also known as Gallop rhythm or ventricular gallop due to rapid ventricular filling phase	(e.g., mitral regurgitation, HF) Normal in children but, in adults, is associated with disease.
S4	The fourth heart sound (S4) occurs during late diastole when the atria contract, pushing blood into a noncompliant or stiff ventricle. This sound is generated by the rapid filling and vibration of the ventricular walls. It is often referred to as an "atrial gallop" because it is associated with atrial contraction	Associated with ventricular hypertrophy (HOCM)

NOW LET'S DISCUSS SOME PAPER MCQ'S

S1

- During cardiac cycle the first heart sound occurs during= isovolumetric ventricular contraction
    - It also comes as
        - Development of first heart sound synchronizes most with the following phase of cardiac cycle= Isovolumetric contraction
        - About S1 sound accompanied with = Isovolumetric contraction and increased ventricular pressure
- S1 related to which phase on ECG= QRS
    - To be more accurate it is after QRS
        - If asked S1 related to JVP then C wave
- Loud S1 occurs in= PR interval less than normal
    - It also comes as
        - The first heart sound becomes louder= When the P-R interval is at the lower limits of normal

S2

- S2 heart sound is heard at the onset of which phase= Isovolumetric relaxation
- Heart sound difference between S1 and S2= S1 has High duration
- Regarding S1=Longer than S2
- S2 (heart sounds) as compared to S1 has = High frequency
    - It also comes as
        - Second heart sound differs from the first heart sound in that= It has a higher frequency
- On auscultation first heart sound is variable in= Atrial fibrillation
- Splitting of S2 heart sound is due to= Delayed closure of pulmonary valve
    - Because during inspiration negative intrathoracic pressure leads to inc venous return to rt heart so the Rt ventricle has to work more therefore pulmonic valve takes a bit longer than aortic to close.
    - Sometimes the options are completely changed and no option of delayed closure of pulmonic valve and then answers is
        - Splitting of the second heart sound into two components is enhanced by= Early closure of the aortic valve
- S2 heart sound produced by=Closure of aortic + pulmonary valve
    - It also comes as
        - The second heart sound is produced by the= Closing of the semilunar valves
- The interval between first and second heart sounds is equal to the duration of the= Ventricular systole
- Second heart sound= Depends on fall of pressure during diastole
- The heart sound heard at the 3rd intercostal space near the left parasternal border is = Aortic A2

S3

- Third heart sound= Also known as ventricular gallop
- Findings of left ventricular hypertrophy=S4 ventricular gallop
- About 3rd heart sound= Always abnormal in adults
- S3 heart sound due to which one of the following= Hypervolemia
- 3rd heart sound is due to=Rushing of blood rapidly in ventricle
  - It also comes as
    - 3rd heart sound is produced due to= Rapid ventricular filling.
    - A soft, low-pitched third heart sound is auscultated in many normal young individuals. it is due to vibrations set up by= Rapid inflow of blood into ventricles
    - The heart sound produced due to vibrations of ventricular wall during rapid ventricular filling is= Third

S4

- S4 heart sound produced by= atrial systole
- The fourth heart sound is produced by= Vibrations in the ventricular wall during atrial systole
- Fourth heart sound is due to = Ventricular filling
- Regarding heart sounds= The audible heart sounds lie in the range of 40 - 500 cycles per second

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55. FASTEST CONDUCTION= PURKINJE FIBERS

NOTE

- Pacemaker rates = SA > AV > bundle of His/Purkinje/ventricles.
- Speed of conduction= Purkinje > atria > ventricles > AV node
- **Location**
  - SA node = Sub epicardium (upper portion of Crista terminalis)
  - AV node = Endocardium (located in posteroinferior part of interatrial septum
  - Conducting system = Sub-endocardium
  - RBBB= located in the interventricular septum and extends into the Septomarginal trabecula (moderator band)

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

CONDUCTING SYSTEM OF HEART

- The Conducting system of the heart comprises of = Specialized cardiac tissue
  - It is also asked as
    - Conducting system of the heart comprises of = Sinoatrial node, the atrioventricular node, bundle of His and Purkinje's fibers
- The conducting system of the heart lies in = Sub endocardium
- The right bundle branch of the conducting system of the heart is present in = Septomarginal trabeculae

AV NODE

- Damage to the posteroseptal wall of the heart affects the = AV node
- Slowest conducting system in heart = AV node

SA NODE

- The initiation of impulses generated leading to contraction of the heart is primarily done by= SA node
- SA Node is situated in = Upper right atrium
  - It is also asked as with different options
    - The SA node is located at the = Top of the right atrium
    - Typical location of SA node = Superior part of crista terminalis
    - The SA node, the pacemaker of heart is situated in the right atrium near the = Superior end of sulcus terminalis
    - Tissue present at upper end of sulcus terminalis beneath crista terminalis = SA node
    - In the right atrium, the SA node is located near the = Crista terminalis

- ❖ An artificial pacemaker is placed due to a defect in the function of which of the following = SA node
- ❖ SA node and uterus receptors = Beta 1 and beta 2

PURKINJE FIBERS

- ❖ Specialty of Purkinje fibers in the heart is = Specialized heart muscle cells
    - o It is also asked as
        - ▪ About Purkinje fibers = Specialized cardiac muscle cells
- ❖ The highest conduction velocity in cardiac tissue is found in = Purkinje fibers
    - o It is also asked as
        - ▪ Speed of current is highest in which conductive system of cardiac tissue = Purkinje fibers
        - ▪ Increased conduction in ventricle is due to = Presence of purkinje fibers
- ❖ Conduction increase in purkinje due to = they have wider diameter
    - o It is also asked as
        - ▪ Which of the following property of Purkinje system contribute for its highest speed of conduction = Large diameter
        - ▪ Conduction velocity in Purkinje fibers is increased due to = Large diameter

SA NODE AS PACEMAKER

- ❖ SA node acts as a pacemaker of heart because=Generates impulses at the faster rate
- ❖ In defective conductive tissue damage of heart, an artificial pacemaker is to be placed in=Moderator band (it is a part of right ventricle—if right ventricle is present prefer that)
- ❖ In a person with 3rd degree AV conduction block, where shall the pacemaker electrodes be placed= Right ventricle
- ❖ SA node acts as pacemaker because= Highest firing rate
    - ▪ It also comes as
        - ● SA node acts as pacemaker because of= phase 4 depolarization
        - ● SA node acts as pacemaker because of= inward Na+ current
        - ● Phase 4 depolarization produced in SA node is due to=Inward Na current into cells
        - ● SA node is a pacemaker because= It has the highest rate of discharge

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56. MITRAL VALVE STENOSIS. WHERE CAN BE MITRAL VALVE BEST HEARD= APEX OF HEART

NOTE THE AREAS OF AUSCULTATION

Heart Auscultation Area (mnemonic APT M)	❖ **A**ortic area→right 2nd intercostal space ❖ **P**ulmonary area→left 2nd intercostal space ❖ **T**ricuspid area→left 4th intercostal space ❖ **M**itral area→5th intercostal space (mid clavicular line--apex beat)

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ Mitral valve murmur is best heard at= Left 5th intercostal space at midclavicular line
- ❖ Mid Diastolic murmur of mitral stenosis is best heard at= Apex of heart
- ❖ Aortic stenosis murmur is best heard at=Right 2nd intercostal space
- ❖ Murmur of the aortic valve stenosis can be best auscultated at=2nd intercostal space right side of sternum
    - o Also remember Aortic regurgitation murmur is best heard at= lower left sternal border
- ❖ The apex of the heart is located at= 5th intercostal space 8 cm lateral to left sternal border
- ❖ The apex of the heart= Lies on an average about 8 cms from the median plane
- ❖ To auscultate the tricuspid valve, stethoscope should be placed at one of the following anatomical site= Right half of lower end of body of sternum
- ❖ The mitral (bicuspid) valve area is over the= Fifth left intercostal space, mid-clavicular
- ❖ Which heart sound is heard at the 3rd intercostal space near left parasternal border= Aortic A2

57. COLLAPSING PULSE (WATER HAMMER PULSE) IS MOST COMMONLY SEEN IN= AORTIC REGURGITATION

ABOUT PULSE TYPES:

Pulsus Paradoxus	❖ >10mmHg fall in systolic blood pressure during inspiration---faint or absent pulse on inspiration ❖ Seen in Cardiac tamponade, severe asthma
Slow Rising Pulses (Pulsus Parvus Et Tardus)	❖ Seen in Aortic stenosis
Collapsing Pulse (Water-Hammer Pulse)	❖ Seen in Aortic regurgitation ❖ Patent ductus arteriosus ❖ Hyperkinetic (anemia, thyrotoxic, fever, exercise/pregnancy)
Pulsus Alternans	❖ Pulsus alternans is characterized by a strong and weak beat occurring alternately ❖ Severe LVF
Pulsus Bisferiens	❖ Pulsus bisferiens is a rapid rising, twice beating pulse ❖ Aortic valve disease
Jerky Pulse	❖ Seen in HOCM
Pulse Deficit	❖ Atrial fibrillation

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Which one of the following is seen in Atrial fibrillation = Pulse deficit
- A patient with strong and weak beat of pulse occurring alternately is seen in= CCF
- Patient with history of sudden death in family and jerky pulse= HOCM
- Collapsing pulse (water hammer Pulse) is most seen in= Aortic regurgitation
- Most important clinical feature of water intoxication= Slow pulse
- A patient in ER was diagnosed with Cardiac tamponade. Which clinical finding will be present= Pulsus paradoxus
- Regarding arterial pulse, which is true= Pressure in arteries against the wall
- The radial pulse is palpated between the tendons of = Abductor pollicis longus and extensor pollicis longus
- Important clinical feature of water intoxication is: = Slow pulse
- Sudden retrosternal pain, nausea, vomiting, and sweating with BP 90/60 and low volume pulse is indicative of = MI
- During inspiration, there is decreased: = Volume of the arterial pulse

58. LOUD S1, OPENING SNAP AND MID DIASTOLIC RUMBLING MURMUR AT APEX ARE CHARACTERISTIC FINDING OF=MITRAL STENOSIS

KEY FEATURES HEART MURMUR

- Mitral regurgitation--Best heard at apex, radiates to axilla
- Tricuspid regurgitation ----Best heard at tricuspid area and radiates upward along sternal border
- Aortic regurgitation--- wide pulse pressure, early diastolic decrescendo murmur
- Aortic stenosis-----Narrow pulse pressure, Crescendo decrescendo systolic ejection murmur, radiates towards carotid
- Pulmonic stenosis------Best heard at pulmonic area

TYPES OF HEART MURMUR

- Ejection systolic:
  - Aortic stenosis, HOCM, pulmonary stenosis, ASD, Fallot's
- Holosystolic (pansystolic)
  - Mitral/tricuspid regurgitation (high-pitched and 'blowing' in character)
  - VSD ('harsh' in character)
- Late systolic:
  - Mitral valve prolapse (mid-systolic click — is the most common sign)
  - Coarctation of aorta
- Early diastolic:
  - Aortic regurgitation (high-pitched and 'blowing' in character)
  - Graham-Steel murmur (pulmonary regurgitation, again high-pitched and 'blowing' in character)
- Mid-late diastolic:
  - Mitral stenosis ('rumbling' in character)
  - Austin-Flint murmur (severe aortic regurgitation, again is 'rumbling' in character)
- Continuous machine-like murmur:
  - Patent ductus arteriosus (Murmur radiates to back)

NOW LET'S DISCUSS SOME PAPER MCQ'S

TYPES OF MURMURS AND ITS CHARACTERISTICS

- Which of the following is a feature of PDA = Machinery murmur
  - It is also asked as
    - A 15-year-old boy with continuous machinery-like murmur and left ventricular hypertrophy likely has = Patent ductus arteriosus
    - Machinery murmur in newborn = PDA
- The most significant finding of aortic regurgitation = Early diastolic murmur
  - It is also asked as
    - Diastolic murmur and weak radial pulse = Aortic Regurgitation
    - Diastolic murmur and wide pulse pressure = Aortic Regurgitation
    - Pulmonary edema, left ventricle EDV increased, PAWP increase, BP 140/48. Early diastolic murmur, very wide pulse pressure. Diagnosis = Aortic regurgitation
    - A known case of left ventricular hypertrophy presented with significantly increased end diastolic volume, increased pulmonary wedge pressure, and increased aortic pressure. There was early diastolic murmur with BP 145/40. What is the likely diagnosis = AR
    - A patient having severe Aortic Regurgitation, which type of murmur she is having = Early diastolic murmur
    - A patient with Diastolic murmur and increased preload. Diagnosis = Aortic Regurgitation
    - Diastolic murmur and weak radial pulse= Aortic Regurgitation.
- Which of the following is increased in aortic regurgitation? = EDV
- Mitral regurgitation murmur is best heard at the = Apex
- Pansystolic murmur and atrial fibrillation indicate? = Mitral regurgitation
  - It is also asked as
    - Pan systolic murmur, plateau pulse, left axis deviation is supportive of? = Mitral regurgitation
    - An 18-year-old female with a history of rheumatic fever comes with dyspnea. Examination of the heart shows mitral regurgitation. Most probably, the murmur will be: = Pansystolic at apex beat area
- A pregnant lady newly developed a mid-diastolic murmur and gives a history of having Rheumatic fever in childhood. She is most likely to suffer from = Mitral stenosis
  - It also comes as
    - Pregnant woman with breathlessness, irregular pulse, mid-diastolic murmur. Likely finding? = Increased pressure gradient across mitral valve

  - Loud S1, opening snap, and mid-diastolic rumbling murmur at apex are characteristic findings of = Mitral stenosis

- ❖ An 18-year-old student has a mid-systolic click followed by a late systolic murmur. The murmur duration increases in standing and shortens with squatting. The most likely diagnosis of this condition? = Mitral valve prolapse

CAUSES AND MURMURS

- ❖ Myxoid degeneration is mostly associated with = Mitral valve prolapse
- ❖ Most likely indication of Mitral Valve replacement = Mitral Valve Prolapse
- ❖ Aortic insufficiency is associated with= Ankylosing spondylitis
- ❖ Pan-systolic murmur after MI due to? = Ventricular septal rupture
- ❖ A pansystolic murmur at the left sternal border in VSD is likely in the = Membranous part of the septum
- ❖ A 50-year-old male patient with murmur on auscultation. On echo, there is downward pull on the atrioventricular valve. This occurs due to = Rupture of Chordae tendineae
- ❖ Women with mitral stenosis at 28 weeks of gestation, her dyspnea worsens due to = Pulmonary HTN
- ❖ A patient newly developed a murmur and gives a history of having Rheumatic fever in childhood. The likely diagnosis is = Mitral stenosis

OTHERS

- ❖ During cardiac diastole, backflow of blood is heard as a murmur at = 2nd ICS on right
- ❖ Pansystolic murmur in aortic area, diagnosis = Tricuspid regurgitation
- ❖ Mid-diastolic murmurs with irregular R-R interval are consistent with = P-Mitrale
- ❖ An 18-year lady with a history of rheumatic fever comes with dyspnea. On examination, the heart shows tricuspid regurgitation. The findings of auscultation will be = Systolic murmur at tricuspid area
- ❖ A patient with mid-diastolic murmur, increased PCWP, pulmonary HTN, and left atrium hypertrophy could also have = Right ventricular hypertrophy
- ❖ Patient had mid-diastolic murmur and left atrial hypertrophy leading to pulmonary hypertension, what other features he would have = RVH

59. SYMPATHETIC ACTIVITY ON HEART CAUSES=INCREASE DIASTOLIC SA NODE RATE

ABOUT THE SYMPATHETIC AND PARASYMPATHETIC EFFECT ON HEART

Parasympathetic Effects on Heart Rate and Conduction Velocity	❖ The SA node, atria, and AV node have parasympathetic vagal innervation, but the ventricles do not. ❖ Decreases heart rate ❖ Decreases conduction velocity through the AV node. ❖ Increases the PR interval.
Sympathetic Effects on Heart Rate and Conduction Velocity	❖ Norepinephrine is the neurotransmitter, acting at β1 receptors. ❖ Increases heart rate ❖ Increases conduction velocity through the AV node. ❖ Decreases the PR interval.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- ❖ Parasympathetic effect on the heart = Decrease HR
  - o It also comes as
    - Which of the following is a parasympathetic effect = Decreases HR
    - Activation of the parasympathetic division of the autonomic nervous system may produce = Decreased heart rate
    - One of the following is caused by depression of parasympathetic vagal action = Increased pulse rate
    - Depressed parasympathetic system will cause = Increase heart rate

- Parasympathetic innervation of the heart is derived from = Vagus nerve
    - It is also asked as
        - The parasympathetic supply of the heart is via = Vagus nerve
- Parasympathetic effect on heart is = Increase PR Interval
    - It also comes as
        - Regarding parasympathetic stimulation, which is correct = Increase PR interval
- Parasympathetic causes decreased heart rate by causing which of the following at SA node = Decreased Na influx
    - It also comes as
        - Vagal stimulation of myocardium acts predominantly at = SA node causing altered Na+ permeability
        - Parasympathetic stimulation decreases the heart rate. This is due to increased permeability of the SA nodal fibers for = Potassium
    - Note that
        - Parasympathetic stimulation decreases heart rate by acting primarily at the SA node, where it increases potassium permeability and decreases sodium Influx
- Strong vagal stimulation effect on heart = Decreased heart rate
- Effect of norepinephrine on heart = Increase in rate of SA node depolarization
    - Note: It also comes with a slightly changed stem and options.
        - Effect of epinephrine on heart = Increases AV conduction

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60. HEART MUSCLE ACTS AS SYNCYTIUM BECAUSE OF= GAP JUNCTION

FEW MCQS OF HEART

- Max heart rate Inc. in= Exercise
- Brain bridge reflex function= Increase heart rate
    - The Bainbridge reflex, also called the atrial reflex, is an increase in heart rate due to an increase ~~in central venous~~ pressure
- Difference of Increase hydrostatic pressure of kidney from heart is= Increase osmotic pressure along capillary flow
- 3rd year student attending surgery for 1st time suddenly collapse, BP 90/60mmHg. Cause= Decrease total peripheral resistance
- A woman had MI 48 hour later she collapsed. On ECG there is Irregular low voltage waves, pathophysiology= Re-entry current

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61. WHICH OF THE FOLLOWING IS INCREASED CAUSING VASOCONSTRICTION DUE TO STRESS OF SURGERY=EPINEPHRINE

KNOW THE DIFFERENCE.

- Which of the following hormones is released during stress = ACTH
    - It also comes as
        - The major "stress" hormone of the body is = Adrenocorticotropic hormone (ACTH)
        - Which hormone is released predominantly under extreme stressful conditions? = ACTH
- Which of the following is the major hormone released during stress = Cortisol
- The main hormone required in the body during stressful conditions is: = Catecholamines
- Which of the following will be released in stress due to surgery = ACTH
    - Note this difference it also comes as with different stems and options
        - Which of the following is increased, causing vasoconstriction due to the stress of surgery= Epinephrine (if catecholamines are in options, prefer that)
        - The increase in systemic vascular resistance secondary to the stress response to surgery is a consequence of = Catecholamine release
- With decreased cortisol levels, an increase of which will be the first response to stress? = CRH
- The hormone that does NOT show an increase in response to stress from surgery = Insulin

- During physiological stress, ACTH concentration is highest in = Venous blood draining the anterior pituitary

62. DURING WHICH OF THE FOLLOWING PHASE OF THE CARDIAC CYCLE DOES VENTRICULAR PRESSURE RISE, BUT VENTRICULAR VOLUME REMAINS CONSTANT=ISOVOLUMETRIC CONTRACTION

REMEMBER ABOUT CARDIAC CYCLE

- Opening and closing of valves causes the physiologic heart sounds.
- When all valves are closed, ventricular volume is constant, and the phase is called isovolumetric

Atrial systole	❖ ECG: Preceded by P wave ❖ Venous Curve: Represented by "a" wave ❖ Heart Sound: 4th sound in ventricular hypertrophy (not audible in normal adults)
Isovolumetric ventricular contraction	❖ Phase: Between mitral valve closing & aortic valve opening; highest O2 consumption ❖ ECG: Begins with QRS complex (ventricular activation) ❖ Heart Sound: AV valves close (1st heart sound), possible split due to mitral closing before tricuspid ❖ Pressure: Increases isovolumetrically, no blood ejection as aortic valve is closed
Rapid ventricular ejection	❖ Aortic Valve: Opens as ventricular pressure > aortic pressure ❖ Ventricular Volume: Decreases significantly as most stroke volume is ejected ❖ Atrial Filling: Begins
Reduced ventricular ejection	❖ Blood Ejection: Slower continuation ❖ Ventricular Pressure: Begins to decrease ❖ Aortic Pressure: Peaks and then decreases with arterial runoff ❖ Atrial Filling: Continues
Isovolumetric ventricular relaxation	❖ Repolarization of the ventricles is now complete (end of the T wave ❖ The aortic valve closes before the pulmonic valve because the pressure in the aorta is higher than in the pulmonary artery. During inspiration, the pulmonic valve closes a bit later, creating a slight split in the second heart sound (S2) ❖ Ventricular pressure drops quickly as the ventricle relaxes. ❖ Ventricular volume stays the same (isovolumetric) because all valves are closed. ❖ The "blip" in the aortic pressure tracing occurs after closure of the aortic valve and is called the **dicrotic notch**, or incisura.
Rapid ventricular filling	❖ When ventricular pressure becomes less than atrial pressure, the mitral valve opens. ❖ With the mitral valve open, ventricular filling from the atrium begins. ❖ Aortic pressure continues to decrease because blood continues to run off into the smaller arteries ❖ Rapid flow of blood from the atria into the ventricles causes the → 3rd heart sound, ❖ 3rd heart sound → normal in children but, in adults, is associated with disease.
Reduced ventricular filling	❖ Longest phase→ Ventricular filling continues, but slower→ depends on HR ❖ Higher Heart rate cause decreased time available for ventricular refilling, decreased end-diastolic volume, and decreased stroke volume.

NOW LET'S DISCUSS SOME PAPER MCQ'S

ISOVOLUMETRIC VENTRICULAR CONTRACTION

- During which of the following phase of the cardiac cycle does ventricular pressure rise, but ventricular volume remains constant = Isovolumetric contraction

RAPID VENTRICULAR EJECTION

- Semilunar valves open during = Rapid ejection
    - It is also asked as
        - Semilunar valve opens during which stage of cardiac cycle = Rapid ejection
        - In a cardiac cycle, semilunar valve opens during = During rapid ventricular ejection
- High ventricular pressure and low ventricular volume is present in = Rapid ejection phase
    - It also comes as
        - High aortic pressure and low ventricular volume is present in=Rapid ejection phase
- During the portion of the cardiac cycle when calcium is entering ventricular cells via slow channels is = Rapid ventricular ejection
- Which of the following event occurs just before opening of aortic valve=Beginning of systole

REDUCED VENTRICULAR EJECTION

- A 54-year-old male is seen in clinic with complaints of palpitations and light-headedness. Physical examination shows a heart rate of 200 bpm and BP 75/40 mmHg. The most likely adjustment that has occurred in the cardiac cycle is = Systolic time has decreased proportionately more than the diastolic time

ISOVOLUMETRIC VENTRICULAR RELAXATION

- The aortic valve closes at the onset of = Isovolumetric relaxation
    - It also comes as
        - Closure of the aortic valve occurs at the onset of = Isovolumic relaxation
        - Closure of the aortic valve occurs at the outset of = Isovolumic relaxation
- During cardiac cycle recording, monitor will show "v" wave of atrial pressure occurring in = Isovolumic relaxation phase
- In cardiac cycle = The dicrotic notch is due to rebound of aortic valve
    - It also comes as:
        - The dicrotic notch in JVP occurs due to = Closure of aortic valve

REDUCED VENTRICULAR FILLING

- Which of the following phase of cardiac cycle is affected by increased heart rate = Reduced ventricular filling
- Tachycardia will decrease which phase of cardiac cycle= Ventricular filling
- Which of the following is responsible for AV nodal delay = Ventricular filling
- Longest phase of cardiac cycle= Slow passive ventricular filling

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63. WHICH OF THE FOLLOWING FILL VENTRICLES MAXIMUM= ATRIAL SYSTOLE

REMEMBER FOR THESE CONFUSING TWO MCQ'S

- Rapid Inflow: Approximately 70-80% of ventricular filling occurs during this phase.
- Atrial Systole: This phase follows rapid inflow and is when the atria contract to push the remaining blood into the ventricles. This phase contributes the final 20-30% of ventricular filling, completing the process of filling the ventricles

REMEMBER THE DIFFERENCE

- During the cardiac cycle, ventricles are filled with blood mainly in one of the following phases= Rapid inflow
- Which of the following fill ventricles up to maximum= atrial systole
- The phase of cardiac cycle with 60-80% filled ventricles is= Rapid inflow
- Ventricles are maximally FILLED during= Atrial systole

IT ALSO COMES AS

- Maximum left ventricular pressure is during the period of= Rapid ejection
- Ventricular filling is highest during= First 3rd of Diastole (80% filling)

64. MAXIMUM FLOW PRESSURE IN CORONARY VESSEL OCCURS AT=BEGINNING OF DIASTOLE

REMEMBER

- Aortic pressure lowest during = Isovolumetric contraction
- Aortic pressure maximum = Slow ejection/Reduced ejection
- Preload depends on=End diastolic volume

NOW LET'S DISCUSS SOME PAPER MCQ'S.

- The portion of the cardiac cycle when aortic pressure normally be the lowest is= During isovolumetric contraction of the left ventricle
- The aortic pressure is highest during one of the following phase of cardiac cycle= Slow ventricular ejection
- Which of the following values are the best indexes of the preload on the heart=Left ventricular end diastolic volume.
  - It is also asked with different options
    - Which of the following values are the best indexes of the preload on the heart=Venous return
- Maximum left ventricular pressure in a young healthy individual= 120mmHg (systemic circulation)
- At what pressure of Right ventricular does pulmonary valve open= 8mmHg
  - Also remember
    - Aortic valve opens when the LV pressure exceeds=80mmHg
- Maximum flow pressure in coronary vessel occurs at= Beginning of Diastole
  - It also comes as
    - Highest blood flow per gram of left ventricular myocardium would occur= At the beginning of diastole

65. THE MAXIMUM SYSTOLIC PRESSURE IS IN WHICH ARTERY= RENAL ARTERY

REMEMBER

- Highest pulse pressure → Femoral artery> popliteal > Aorta
- Highest MAP → aorta
- Highest systolic pressure → Renal artery
- Highest Oxygen tension → pulmonary capillaries

NOW LET'S DISCUSS SOME PAPER MCQ'S.

- The amplitude of the pulse pressure is greatest in the= Femoral artery
- The maximum systolic pressure is in which artery= Renal artery
- Highest pulse pressure is in= Femoral artery
- Pulse pressure= Is higher in peripheral arteries than that in the aorta
- Maximum O2 tension is in=Pulmonary capillaries

66. MOST IMP RESPONSE IN SHOCK AS A WHOLE = SYMPATHOADRENAL RESPONSE

- While most immediate response = Baroreceptors
- While most potent/most important initially= CNS ischemic response
  - WHILE most important response in a shock as a whole is = Sympathoadrenal response
- Max feedback to maintain arterial pressure= RAAS
- While responsible for maintaining body in shock= Adreno-sympathetic (RAAS)

ONE MORE METHOD TO REMEMBER THESE IMPORTANT MCQS

- Most of the mechanism triggered in case of acute blood loss → Baroreceptor reflex
- Most important mechanism triggered in severe hemorrhage → Baroreceptor reflex
- Most quick mechanism triggered in severe hemorrhage → Baroreceptor reflex

- Most potent mechanism triggered (activate < 60 BP) → CNS ischemic response
- Most chronic / prolong mechanism triggered → RAAS

ABOUT BARORECEPTORS REFLEX

- Locations:
    - Carotid Sinus: At the bifurcation of common carotid arteries.
    - Aortic Arch: In the aortic arch.
- Nerve Supply:
    - Carotid Sinus: Sinus nerve of Hering (branch of glossopharyngeal nerve, CN IX).
    - Aortic Arch: Aortic nerve, joining the vagus nerve (CN X).
- Function:
    - Carotid Sinus: Responds to both increases and decreases in blood pressure.
    - Aortic Arch: Responds to increases only in blood pressure.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

BARORECEPTORS

- Baroreceptors detects= Change in arterial blood pressure
    - It also comes as
        - Function of baroreceptor in blood pressure is=Increase arterial pressure
        - Baroreceptors are most sensitive to = Rapidly decreasing BP
        - Baroreceptors are most sensitive to = Rapidly decreasing arterial pressure
- Baroreceptor reflex increases which of the following=MAP
    - It also comes as
        - The main function of baroreceptors is maintaining= MAP
- Short term BP is regulated by=Baroreceptor
- A woman is taking antihypertensive for 1 year. On standing from sitting, his BP decreases from 120/80 to 90/60, and her heart rate increases from 70 to 120 b/m. The mechanism of increase heart rate is=Decrease firing from baroreceptors
    - Know the difference
        - An unconscious pt is pale with cold clammy skin. O/E his pulse is rapid and thready. His MAP is 50mmhg and low. Which one of the following parameter will decrease to increase to BP= Firing of baroreceptor
- The mechanism of increase heart rate is=Decrease firing from baroreceptors
- Which of the following is a rapid method to lower Inc BP=Baroreceptors
- Which of following will increase heart rate=Bainbridge reflex
- In orthostatic HTN, reflex tachycardia occurs due to= Decrease firing of baroreceptors
- A person with decreased BP, the baroreceptor reflex will be to= Increase mean arterial pressure
- What is the fastest way to maintain the arterial pressure= Baroreceptors
- Boy stands from lying position. BP normalizes by= Baroreceptor
- About baroreceptor= present in adventitia of large arteries
- Nerve taking afferents from baroreceptors= Glossopharyngeal
- Baroreceptor effect= Decrease compliance of veins
- With sudden hemorrhage of two liters of blood, the most likely first response would be= Baroreceptor reflex
- The fastest control of blood pressure is achieved by= Baroreceptors
- A patient with hemorrhage in RTA has unreportable BP. Receptors in aortic and carotid detect= Decrease pO2
- The most likely variable which decreases in response to a decrease in arterial blood pressure is = Neural activity in the carotid sinus nerve
- The most important feature of carotid sinus is= Stimulated by changes in blood pressure/baroreceptors
- Renin secretion is increased by = Decrease stretch of atrial baroreceptors receptors

- ❖ Stimulation of high-pressure baroreceptors of a 37-year-old female is associated with = Increased impulse traffic in vagal efferents to myocardium

RAAS

- ❖ Which of the following is responsible for long term control of HTN=Renin angiotensin system
- ❖ Maximum feedback gain in controlling blood pressure is by which one of the following= RAAS
- ❖ The mechanism responsible for long-term control of changes in arterial blood pressure is = Renin angiotensin system
- ❖ Low blood flow to kidney, aldosterone is released by = RAAS
- ❖ In athletes, increased sodium absorption in DCT is due to = RAAS
- ❖ The most important compensatory mechanism in the "shock state" = Increased sympatho-adrenal discharge

CNS ISCHEMIC RESPONSE

- ❖ A semiconscious pt has rapid thready pulse calm and cold skin with a MAP 50m mHg. In this condition of shock which will give max benefit to pt=Brain ischemic response
- ❖ A patient unconscious from half hour after accident is bought to the hospital looks pale cold and clammy, pulse rapid and thready. His MAP is <60, PO2 60mmhg. Which will provide rapid response= CNS ischemic response
- ❖ A man presents to ER after 1 hr of severe hemorrhage. O/E BP 60/40, pulse rapid with cold and clammy skin. Which mechanism is most active at this stage= CNS ischemic response
    - o It is also asked as
        - ▪ A patient had an accident and was brought to ER. BP < 60 mmHg. Most pronounced effect = CNS ischemic response
        - ▪ A patient goes onto a shock like state, which one of the following will be activated= CNS ischemic response
        - ▪ Pt. had accident, BP less than 60. Which effect is most pronounced= CNS ischemic response
- ❖ During shock most important= CNS ischemic response

REMEMBER THESE CONCEPTUAL MCQS

- ❖ A pt. was brought to ER in state of massive hemorrhage because of trauma and leaded hypotension baroreceptor compensation lead to= Decrease venous compliance
- ❖ A person had blood has which cause a decrease in mean arterial pressure from 100 to 70 mmHg. The most likely change would be= Increased cardiac sympathetic efferent activity
- ❖ The BP recording of 2 males, a hypertensive with reading of 180/110 and a normotensive with 120/80 were noted respectively. If 10mmhg is added to the mean BP of both, how will the response of hypertensive patient vary from that of normal= Increase parasympathetic activity
    - o In hypertensive patient, baroreceptors are adopted to high pressure so it won't fire even with that persistent high pressure but when there is a small change like adding 10mmHg, baroreceptors will detect that change & start firing so parasympathetic activity of hypertensive will increase. But on the other hand, in normotensive patient, adding 10mmHg is still in normal limit, so baroreceptors will not fire until & unless there is significant increase in blood pressure

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67. CIRCULATION IN HEART IS MAINTAINED BY = LOCAL METABOLITES

REMEMBER FORAUTOREGULATION.

Local metabolites for HEART	Hypoxia (↓O2) and adenosine
Local metabolites for BRAIN	CO2 (pH)
Skin	Sympathetic stimulation most important mechanism for temperature control
Skeletal muscle	At rest: sympathetic tone

(CHALK)	Local metabolites during exercise: CO2, H+, Adenosine, Lactate, K+,

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

SKIN

- Organ whose blood flow is controlled by sympathetic rather than local metabolites is = Skin
    - It also comes as
        - Sympathetic regulation occurs in which of the following instead of local metabolites = Skin
        - In exercise, blood flow is increased to which organ via stimulation of sympathetic system = Skin

MUSCLE

- Blood flow through non-exercising muscle is controlled by = Sympathetic cholinergic
    - While
    - In which organ blood is regulated early by sympathetic system and then by local metabolites = Exercising muscle
    - During exercise, the skeletal muscle blood vessels are dilated by = Local metabolites
    - During exercise, increased blood supply to muscle is via = Local metabolites
- In exercise, blood flow is increased to = Skeletal muscles
- In a healthy man, metabolic requirements exceed blood circulation to deliver oxygen in? = Skeletal muscle
- Compared with the resting state during prolonged exercise, the calories need of skeletal muscle are met by = Release of free fatty acid from adipose tissue
- An increase in blood flow through a skeletal muscle is most likely caused by = Alpha-receptor blocking agents
- Which of the following factors decreases in skeletal muscles during exercise = Arteriolar resistance
- During exercise, total peripheral resistance (TPR) decreases because of the effect of = Local metabolites on skeletal muscle arterioles
    - It also comes as
        - During exercise, Dec TPR is due to = Local metabolites
        - Which of the following parameters is decreased during moderate exercise = Total peripheral resistance (TPR)
- During exercise, there is decreased blood flow to = Kidney (kidney > splanchnic---if kidney is not in option prefer splanchnic)

CORONARY CIRCULATION

- Coronary circulation is under direct control of = Local metabolites
- Coronary blood flow is mainly maintained by=Myocardial o2 demand/consumption
- The coronary arterial blood flow = Is regulated mainly by myocardial oxygen consumption
- The major factor responsible for regulation of the coronary blood flow is = Local metabolism of the myocardium

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68. A TALL YOUNG MAN WITH SUDDEN EXCRUCIATING CHEST AND EPIGASTRIC PAIN, LENS SUBLUXATION, AND LOW BP, LIKELY DIAGNOSIS = DISSECTING AORTIC ANEURYSM

ABOUT ANEURYSM

Overview

- Definition: Localized abnormal dilation of a blood vessel.
- True Aneurysm:
    - Involves all three layers of the vessel wall or the attenuated heart wall.
    - Examples: Atherosclerotic aneurysm, syphilitic aneurysm, left ventricular aneurysm.
    - Types:

	• Saccular: Spherical outpouching involving only a portion. • Fusiform: Circumferential dilation. ❖ False Aneurysm: A breach in the vascular wall, leading to an extravascular hematoma (pulsating hematoma).
Causes And Pathogenesis	❖ Berry Aneurysm: o Deficiency or lack of tunica media due to developmental weakness. o Common in the circle of Willis in the brain. o Associated with subarachnoid hemorrhage and polycystic kidney disease. o Develop at congenital weak points at artery bifurcations, unrelated to atherosclerosis. ❖ Dissecting Aneurysm: o Blood dissects between arterial wall layers due to a deficiency in tunica intima. o Causes include hypertension, bicuspid aortic valve, and connective tissue disorders (e.g., Marfan syndrome). o Symptoms: Tearing chest pain, radiating to the back, unequal BP in arms, and mediastinal widening on CXR. o Types: • Stanford Type A (Proximal): Involves the ascending aorta; treated with surgery. • Stanford Type B (Distal): Involves the descending aorta; treated medically with β-blockers followed by vasodilators. ❖ Cystic Medial Necrosis: Necrosis of the tunica media, commonly associated with the ascending aortic aneurysm in conditions like Marfan syndrome
Specific Types of Aneurysms	❖ Abdominal Aortic Aneurysm: o Often occurs in the abdominal aorta due to atherosclerosis. o Risk factors: Tobacco use, older age, male sex, family history. o Presentation: Pulsatile abdominal mass. ❖ Syphilitic (Luetic) Aneurysm: o A complication of tertiary syphilis. o Involves obliterative endarteritis of the vasa vasorum and medial necrosis, leading to a "tree bark" appearance. o Typically affects the ascending aorta. o Clinical findings: Aortic regurgitation, brassy cough (compression of left recurrent laryngeal nerve).
Key Differences to Remember	❖ Ascending Aortic Aneurysm: Think cystic medial necrosis or connective tissue disorders. ❖ Descending Aortic Aneurysm: Think about atherosclerosis. ❖ Berry Aneurysms: Not present at birth; develop later due to congenital medial weakness. ❖ Dissecting Aneurysms: Caused by medial necrosis, often linked with hypertension or Marfan syndrome

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

DISSECTING AORTIC ANEURYSM

- A tall young man with sudden excruciating chest and epigastric pain, lens subluxation, and low BP, likely diagnosis = Dissecting aortic aneurysm
  - It is also asked as
    - A tall young man who works in a circus presents with sudden, excruciating chest pain. His BP is 90/60 mmHg, pulse is 130/min. He also has a dislocation of the crystalline lens. The most likely cause of his chest pain is: = Dissecting aneurysm of the aorta
    - Aortic dissecting aneurysm and ectopia lentis occurs in = Marfan syndrome
- A Patient with lens dislocation upward aortic dissection & hyperflexible joints is suffering from = Marfan syndrome

- A hypertensive 40-year-old man developed severe chest pain and died. At autopsy, there was an extensive dissecting aneurysm of the aorta. The most likely cause is = Medial necrosis of aorta
  - It also comes as
    - A 40-year-old man, known hypertensive, presented with sudden severe chest pain, massive hemorrhage, and died in ER. He was found to have aortic dissection. The autopsy would show = Medial necrosis
    - Severe chest pain. Patient died. On autopsy, dissecting aorta. What is the cause = Medial necrosis
    - Medial necrosis on autopsy is seen in = Dissecting aneurysms
    - 50 yrs. old hypertensive with severe chest pain radiating to back. Died. On autopsy findings will be= Medial necrosis of aorta.

OTHER ANEURYSM

- Most common site of berry aneurysm is = Origin of Anterior Communicating artery
- Berry aneurysms are seen in = Cerebral arteries
- Patient presented with decreased peripheral pulsation with abdominal pain and creatine kinase normal and pulsating abdominal mass with fasting glucose of 130-150 for the last 20 years is most likely suffering from = Abdominal aortic aneurysm
- 65-year-old with abdominal pain, pulsatile mass, diminished pulses in legs. Likely condition? = Atherosclerotic aortic aneurysm
- As a result of anatomic relationships, pressure symptoms secondary to an aneurysm of the aortic arch are most likely to involve = Left pulmonary artery
- Cardiac anomalies in patients with Turner syndrome = Coarctation of aorta, bicuspid aortic valve, aortic aneurysm
- Cause of atheroma= Diastolic HTN

KNOW THE DIFFERENCE

- A 30-year male died suddenly after a sudden rise on blood pressure. On autopsy, the ruptured vessel completely lacked the **tunica MEDIA** at the point of the aneurysm. The most likely type of aneurysm is= Berry aneurysm
- A 30-year male died suddenly after a sudden rise on blood pressure. On autopsy, the ruptured vessel completely lacked the **tunica INTIMA** at the point of the aneurysm. The most likely type of aneurysm is= Dissecting aneurysm

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69. RAYNAUD'S PHENOMENON IS PRESENT IN = PERIPHERAL VASCULAR DISEASE

ABOUT RAYNAUD'S DISEASE AND PHENOMENON

- Raynaud's Disease (Primary Raynaud's):
  - Definition: A vasospastic disorder affecting medium-sized vessels, particularly in the fingers and toes.
  - Mechanism: Caused by episodic vasospasm resulting from an exaggerated vasomotor response to cold or emotional stress.
  - Commonly occurs in young, healthy individuals, often women, with no underlying disease.
- Raynaud's Phenomenon (Secondary Raynaud's):
  - Definition: Similar vasospasm affecting medium-sized vessels, but associated with underlying diseases.
  - Causes: Systemic lupus erythematosus (SLE), systemic sclerosis, and cryoglobulinemia, Atherosclerosis, Buerger disease (thromboangiitis obliterans).

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- A young, apparently healthy, non-smoking woman with no obvious underlying disease complains to her physician that her fingers and hands undergo dramatic color changes, from white to blue to red, when she gets cold or upset. Physical examination demonstrates modest atrophy of the skin and muscles of her hands. Which of the following is the most likely diagnosis = Raynaud disease
- Raynaud's phenomenon is seen in: Cryoglobulinemia
- Raynaud's phenomenon is present in = Peripheral vascular disease

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70. POLYARTERITIS NODOSA DIAGNOSIS BY= FIBRINOID NECROSIS

REMEMBER: POLYARTERITIS NODOSA (ANY VASCULITIS) = FIBRINOID NECROSIS

Large vessel vasculitis	**Giant Cell (Temporal) Arteritis** ❖ Most common Granulomatous inflammation ❖ Common sites: temporal, ophthalmic artery ❖ Clinical findings: throbbing headache (Unilateral), jaw claudication. May lead to irreversible blindness due to ophthalmic artery occlusion. ❖ Associated with polymyalgia rheumatica. ❖ Diagnosis: temporal artery biopsy **Takayasu Arteritis** ❖ Pulse less disease (weak upper extremity pulses) ❖ Granulomatous thickening and narrowing of aortic arch and proximal great vessels
Medium sized vasculitis	**Polyarteritis Nodosa** ❖ Typically involves renal and visceral vessels, sparing pulmonary arteries. ❖ Hepatitis B seropositivity in 30% of patients. **Kawasaki Disease** ❖ Self-limiting disease ❖ Also called Mucocutaneous lymph node syndrome: fever; hemorrhagic edema of conjunctivae, lips, and oral mucosa; and cervical lymphadenopathy ❖ May develop coronary artery aneurysms, thrombosis or rupture can cause death
Small Sized Vasculitis	**ANCA Positive** ❖ C-ANCA positive→ Wegner Granulomatosis ❖ P-ANCA positive→ Churg Strauss Syndrome and Microscopic Polyangiitis

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

POLYARTERITIS NODOSA (PAN)

- A 35-year-old female diagnosed with polyarteritis nodosa 2 years back presents with a blood pressure of 200/120 mmHg. The characteristic feature confirming the diagnosis is = Fibrinoid necrosis of arterioles
    - It also comes as
        - The pathological finding in polyarteritis nodosa is = Fibrinoid necrosis
        - Microscopic diagnosis of polyarteritis nodosa vasculitis in female is by = Fibrinoid necrosis in arterioles
        - Polyarteritis nodosa diagnosis by = Fibrinoid necrosis
- Polyarteritis nodosa is associated with = Hepatitis B
- Wegner glomerulus vasculitis most diagnostic feature= Fibrinoid necrosis

GIANT CELL ARTERITIS (TEMPORAL ARTERITIS)

- Best confirmatory investigation for temporal arteritis = Temporal artery biopsy

- ❖ A 55-year male presents with right-sided headache, visual disturbance. O/E Temporal artery firm, tender and thus biopsied. The probable diagnosis is = Giant cell arteritis
  - o It is also asked as
    - ▪ A 60-year-old man presented with severe headache, which gradually localized on the left side. He suddenly started having blurring of vision. The temporal artery felt firm and was biopsied. Most likely diagnosis = Giant cell arteritis
    - ▪ A 55-year male presents with throbbing headache, shoulder and neck pain and suddenly started having visual disturbance. O/E ESR raised, Temporal artery firm, tender and thus biopsied. What is the probable diagnosis=Giant cell Arteritis
- ❖ Giant cell arteritis is associated with = Polymyalgia rheumatica

ANCA-ASSOCIATED VASCULITIS

- ❖ Positive c-ANCA is associated with = Vasculitis
  - o It is also asked as
    - ▪ Anti-neutrophils cytoplasmic antibody (ANCA) is present in= Vasculitis
- ❖ Granulomatous Polyangiitis is associated with = c-ANCA
  - o It also comes as
    - ▪ A patient presented with small sized vasculitis, sinusitis, granuloma. On investigation C-ANCA positive, diagnosis= Wegner Granulomatosis
    - ▪ C-ANCA is associated with = Wegener granulomatosis
- ❖ One of the following types of hepatitis is associated with an immune mediated vasculitis characterized by P-ANCA antibodies= Hepatitis B
  - o It also comes as
    - ▪ p- ANCA granulomatosis vasculitis is associated with= Hep B

KAWASAKI DISEASE

- ❖ The vasculitis in a child with coronary aneurysm is most likely due to = Kawasaki's disease
- ❖ A 6-year-old Japanese boy was brought to ER with severe chest pain while playing. O/E he has severe conjunctivitis, edema of lips, suspected aortic aneurysm. Diagnosis = Kawasaki disease
  - o It is also asked as
    - ▪ A 9-month-old Japanese boy with severe conjunctivitis, edema of lips and oral mucosa, cervical lymphadenopathy, and aneurysm. Diagnosis = Kawasaki disease
    - ▪ A 6-month-old Japanese boy presented with sudden onset of fever, skin rash and conjunctivitis. On examination there is edema of the hands, oral erosions and generalized lymph node enlargement. Angiography revealed coronary aneurysm. The vasculitis in this infant is most likely due to= Kawasaki disease
- ❖ A 10 years old boy playing suddenly fell and died. On postpartum examination myocardium is normal and aneurysm is present in coronary vessel. Cause of death=Kawasaki disease

ENDARTERITIS

- ❖ A patient has sarcoma of the limb treated with radiotherapy. Few months later, developed skin ulcer and fibrosis. The likely cause = Endarteritis obliterans

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71. A 55-YEAR-OLD HTN WOMEN WANTS LIFESTYLE MODIFICATION ADVICE. THE ADVICE SHALL BE= WALK 1-MILE DAILY

- ✓ Note: even though salt restriction and weight reduction are also life style modifications, but with exercise greater reduction of about 4-9%)

SOME PAST PAPER MCQS RELATED TO HTN

HYPERTENSION

- Most common cause of hypertension = Idiopathic
- A major factor increasing risk of atheroma = Systemic diastolic hypertension
- Chronic renal disease, pheochromocytoma, Conn's syndrome, and coarctation of aorta are conditions that most likely lead to = Hypertension
- Common feature of pheochromocytoma, Conn's, coarctation of aorta, CKD, and acromegaly = Hypertension
- Likely feature of Apparent Mineralocorticoid Excess (AME) = Hypertension
- Persistent increase in renin occurs in = Secondary Hypertension
- Most common cause of thoracic aorta dissection is=HTN
- A 50-year lady DM/HTN on diuretic presented with hyperkalemia and unconscious and normal RBS. Cause is=ARF

Effects of Hypertension

- Most common effect of hypertension on the eyes = Retinopathy
- Lesion seen in kidneys with hypertension = Hyperplastic arteriolosclerosis
- Important sign in eyes due to arteriosclerosis from hypertension = Changes at arteriovenous crossings (AV nipping)
- Fundus changes in long-standing hypertension = Hard exudates
- Most common complication of hypertension = Left ventricular hypertrophy
    - It also comes as
        - A 60-year man with long standing HTN and aortic stenosis. The histology of his heart will show=Hypertrophy of ventricular cells
- Cause of atheroma=Diastolic HTN
- Myogenic vascular response to hypertension = Vasoconstriction
- In essential hypertension, atherosclerosis is due to = Hyaline
- Most serious health risk for a patient with smoking, hypertension, and high cholesterol = Atherosclerosis
- Regarding essential hypertension = Increased oxygen demand
- A female pt with chronic hypertension was started ACE inhibitor with which her BP was controlled but she complains of dizziness. What is the most likely cause of decreased blood supply to brain = Decrease sympathetic response

Drugs

- A pregnant woman presented with hypertension. The drug of choice will be=Methyldopa (Remember labetalol > methyldopa)
- DOC (drug of choice) for diabetic patient with hypertension = captopril
- A 48-year-old male came in with BP 150/95. First line drug for hypertension to be given is = Lisinopril
- A 40 yr. HTN man with BP 165/85. Which antihypertensive should he be started on=ACE inhibitor
    - Note
        - Nice guidelines: patients < 55-years-old: ACE inhibitor
        - Patients > 55-years-old or of Afro-Caribbean origin: calcium channel blocker or diuretics
- The most appropriate drug for hypertension in a diabetic, heavy smoker is = Nifedipine
- If atrial natriuretic peptide is used therapeutically, it will be beneficial in: = hypertension.
- In a patient with bronchial asthma and ischemic heart disease, the immediate treatment of intraoperative hypertension is to use: = Intravenous nitroglycerine

Blood PressureR egulation and Response

- 42-year-old woman on hypertension medication, dizziness upon standing. Variation in HR upon standing = Increased vasomotor activity
- Dietary study shows increased sodium intake is correlated with high BP. Food item with greatest sodium = Can of soup

72. A WOMAN WITH 10 DAYS HX OF FEVER, CONTINUOUS CHEST PAIN RADIATING TO BACK ON AUSCULTATION RUSTLING SOUND IS HEARD. DIAGNOSIS= PERICARDITIS

Cardiac Tamponade	❖ Compression of heart by fluid (e.g., blood, effusions) in pericardial space. ↓ CO ❖ Findings ○ Beck triad (hypotension, distended neck veins, distant heart sounds), ↑ HR, Pulsus paradoxus
Acute Pericarditis	❖ It refers to Inflammation of the pericardium ❖ Clinical features: ○ Sharp pain, aggravated by inspiration, and relieved by sitting up and leaning forward. ○ Rustling sound heard on auscultation ○ Pericardial friction rub ○ Muffled heart sounds ❖ Causes ○ Idiopathic (most common), Viral (Coxsackievirus), Autoimmune (eg, SLE, rheumatoid arthritis), acute STEMI or Dressler syndrome ❖ ECG: ○ Widespread concave (saddle shaped) ST elevation ○ PR depression= most specific ECG marker for pericarditis
Acute Myocarditis	❖ This is inflammation of myocardium ❖ Findings--Chest pain, fever, palpitations, tachycardia, soft S1, S4 gallop
Cushing Triad:	❖ Physiological nervous system response to increased intracranial pressure (ICP) ❖ Findings: Bradycardia. Inc BP, Dec respirations

NOW LET'S DISCUSS SOME PAPER MCQ'S

PERICARDITIS

- Pt presented with fever and shortness of breath. On auscultation, there is a rustling sound over the apex area. Which area of the heart is involved = Pericarditis
    - It is also asked as
        - Pt presented with fever and shortness of breath. Auscultating the chest while asking the patient to lean forward, a high-pitched rustling sound is heard over the apex area. The likely diagnosis is = Pericarditis
        - A female presented with fever for 10 days and chest pain radiating to the back. On auscultation, a rustling sound is heard. What is the likely diagnosis = Pericarditis
        - A female with fever, chest pain, and rustling sound likely has = Pericarditis
        - Patient has fever for one week. On auscultation, lung fields are clear. There is a rustling murmur on the left of the sternum. Diagnosis = Pericarditis
        - Patient presented with pain radiating to the back. O/E, muffled heart sounds are present on the left sternal border. Diagnosis = Pericarditis
- A patient presented with fever for 10 days and chest pain. The chest pain is aggravated by inspiration and relieved by leaning forward. The likely cause is = Pericarditis
    - It is also asked as
        - A 30-year-old lady had a fever for the last 10 days. Recently she developed continuous chest pain worse on lying down. The most likely structure involved = Pericardium
- A 23-year-old man is stabbed in a bar fight. The knife enters the chest in the left 5th intercostal space, just lateral to the sternum, piercing to a depth of approximately 4 cm. What structure is most likely damaged = Pericardium
- Likely diagnosis in a patient with stable angina, SOB, and pericardial friction rub with raised creatinine and urea = Uremic pericarditis
    - It also comes as

- A 75-year-old male with stable angina presents to ER with SOB. Labs show creatinine 10, urea 200. Auscultation reveals a pericardial friction rub and signs of effusion. The likely diagnosis = Uremic pericarditis
- Patient has pericardial friction rub with deranged renal function tests — urea increased, creatinine 8. What is the cause of pericarditis = Fibrinous (the other options were transudative and restrictive)

MYOCARDITIS

- A young female presented with fever for last 10 days and continuous chest pain unrelated to respiration. Likely cause is=Myocarditis
- Myocarditis scenario organism involved= coxsackie virus
- An 18-year-old girl died suddenly and unexpectedly with only history of headache 2 days back. On autopsy, abundant lymphocytes in myocardium were noted and the heart valves normal. The most probable cause is = Coxsackie B Myocarditis

CARDIAC TAMPONADE

- A scenario was given about pt. arriving in ER, Cardiac tamponade dx was made, clinical finding was asked= Pulsus paradoxus
- MI 9th day suddenly die in washroom= Cardiac tamponade
- A male with transmural myocardial infarction died suddenly in washroom after 8 days. The most likely cause is=Cardiac tamponade
- A 75-year-old man with an acute myocardial infarction suddenly dies 6 days after the infarct. At autopsy, there is a large amount of blood in the pericardial sac. The most likely cause of death = Cardiac tamponade

OTHERS

- A middle-aged man had a myocardial infarction. Which of the following condition is he most likely to develop in the next 24 hours=Ventricular arrhythmias
- Most important cause of low amplitude QRS complex is= Old MI (other common causes are Tamponade and Constrictive pericarditis)
- Which of the following cellular process is most likely to occur in the myocardium of a patient with myocardial infarction who is being treated with fibrinolytic agents= Free radical formation
- In Myocardial Infarction, Type of shock is= Cardiogenic Shock
    - It also comes as
        - Cardiogenic shock is commonly caused by=Myocardial infarction

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73. CUSHING REFLEX, WHICH ONE OF THE FOLLOWING IS SEEN= DEC HEART RATE

REMEMBER:

- ↑ ICP-- Cerebral ischemia and ↑PCO2 in brain and ↓ pH--- ↑sympathetic activity---↑ arterial sympathetic ↑ in perfusion pressure (hypertension) -- ↑ stretch --- peripheral reflex baroreceptor induced bradycardia.
- Note: Cushing Reflex----Triad of Bradycardia. Hypertension, Respiratory depression

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Cushing reflex, which one of the following is seen= DEC Heart rate
- Cushing triad= Raise ICP, HTN, Bradycardia
- Increased B.P with decreased heart rate occurs in= Inc. ICP
- When intra cranial pressure increases, the mechanism which tends to maintain cerebral blood flow is=Cushing reflex

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74. TWO-YEAR-OLD CHILD, BORN PREMATURE. MOST COMMON CARDIAC DEFECT= PDA

Cyanotic heart disease	❖ Truncus arteriosus ❖ Transposition of great vessels ❖ Tricuspid atresia ❖ Tetralogy of Fallot
Acyanotic heart disease	❖ VSD ❖ ASD ❖ PDA
Patent ductus arteriosus	❖ Failure of closure of the fetal ductus arteriosus ❖ Associated with a continuous, "machine-like" murmur. ❖ PDA is normal in utero and normally closes only after birth
Coarctation of aorta	❖ Narrowing of the aorta, usually distal to the origin of the subclavian arteries ❖ Hypertension in upper extremities and weak delayed pulse in lower extremities (brachial-femoral delay). ❖ With age, collateral arteries erode ribs (notched appearance on CXR).
Tetralogy of fallot and transposition of great arteries	❖ TGA is most common cause of cyanosis at birth ❖ TOF-----Most common cause of early childhood cyanosis, does not usually present until 1-2 months therefore TGA is common at birth
Most common	❖ VSD> ASD> PDA> TOF

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

PATENT DUCTUS ARTERIOSUS (PDA)

- In fetal life, shunting of blood between the pulmonary trunk and aorta occurs through = Patent ductus arteriosus
- In a one-year-old child with patent ductus arteriosus = arterial PO2 is below normal
- A 15-year-old boy was brought to pediatric cardiac surgery unit for evaluation. The most likely cardiac abnormality is = Patent ductus arteriosus
- One of the following is true regarding indomethacin = Causes closure of patent ductus arteriosus
    - It is also asked as
        - The treatment of choice in PDA closure is = Indomethacin
        - The drug of choice in PDA closure = Indomethacin
- The anomaly that may still be present at birth in a term pregnancy is = PDA
- The most common anomaly in premature infants = PDA (Patent ductus arteriosus)
    - It also comes as
        - Baby delivered at 32 weeks of gestation. Which condition is most likely to be in baby = PDA
- Most common anomaly of large vessels = PDA
- Which is most commonly present along with PDA = Atrial septal defect
- A pregnant lady living at a hill station presented at term with labor pain. Ultrasound revealed a normal fetus with no anomaly. Which anomaly can still be present at birth = PDA

COARCTATION OF AORTA

- The most likely abnormality seen in coarctation of the aorta is = Aortic lumen is significantly narrowed just below the origin of the left subclavian artery
- Weak pulses in lower limbs than upper limbs and there is radio femoral delay diagnosis is= Coarctation of aorta
- An adult male with hypertension, notable difference in BP between upper and lower limbs, and radio-femoral delay = Coarctation of aorta
    - It is also asked as
        - An adult male with hypertension, BP difference in limbs, and radio-femoral delay = Coarctation of aorta
        - A young male presented with unequal BP in both arms. O/E shows intercostal pulsation and X-ray with rib notching. Diagnosis = Post ductal aortic coarctation

- Bicuspid aortic valve association = Coarctation of aorta
  - It is also asked as
    - A 35-year-old patient is found to have a bicuspid aortic valve. What other congenital anomaly is most commonly encountered with this disease = Coarctation of aorta

TETRALOGY OF FALLOT (TOF)

- A 15-year-old with a history of tetany and recurrent oral candidiasis. He has been operated on for Tetralogy of Fallot and absent thymus. He is most likely to suffer from = DiGeorge syndrome
- Long scenario: Infant with cyanosis after crying along with VSD and pulmonary stenosis. Possible disease = Tetralogy of Fallot
- 10-year-old boy had cyanotic spells on exertion (cyanotic spells were mentioned as on-and-off bluish discoloration of fingers and nails). What is your diagnosis = TOF (classical scenario of TET spell in TOF)
- Which one of the following is a Cyanotic heart disease = Tetralogy of Fallot
- Which of the following is a feature of TOF? = Overriding of aorta with VSD
- Cyanotic spells in a 10-year-old boy after exertion are due to = TOF (Tetralogy of Fallot)
- A child diagnosed with TOF after cyanosis. Which one of the following would likely be present? = Right ventricular hypertrophy
- What is the position of the aorta in patients with Tetralogy of Fallot = Aortic arch anterior to pulmonary artery
- Omphalocele is associated with = Tetralogy of Fallot (TOF)

OTHERS

- Atrial septal defect (ASD) is caused by = Failure of septum primum to fuse with secundum
- Which congenital defect is associated with maternal diabetes = Transposition of great vessels
- Baby born; after 12 hours becomes cyanotic, decreased oxygen saturation. Diagnosis = Transposition of great arteries
- Regarding Transposition of great vessels, which is true? = Aorta is in connection with right ventricle
- The congenital anomaly resulting from failure of separation of the aorta from the pulmonary artery is = Truncus arteriosus
- Neural crest cells migrating from the hindbrain contribute to = Endocardial cushion in conus cordis and truncus arteriosus
- The venous pO2 will be close to 70mmHg in which condition = Left to right shunt

MOST COMMON

- What is the most common cause of congenital cyanotic heart disease=Tetralogy of Fallot
- Most common large vessel anomaly= PDA
- Most common congenital cardiac anomaly= VSD
- Most common anomaly of congenital heart= VSD
- The most common congenital cardiac malformation is = Ventricular septal defect
- Most common Heart condition associated in premature babies= PDA
- Most common anomaly in premature infants is=PDA

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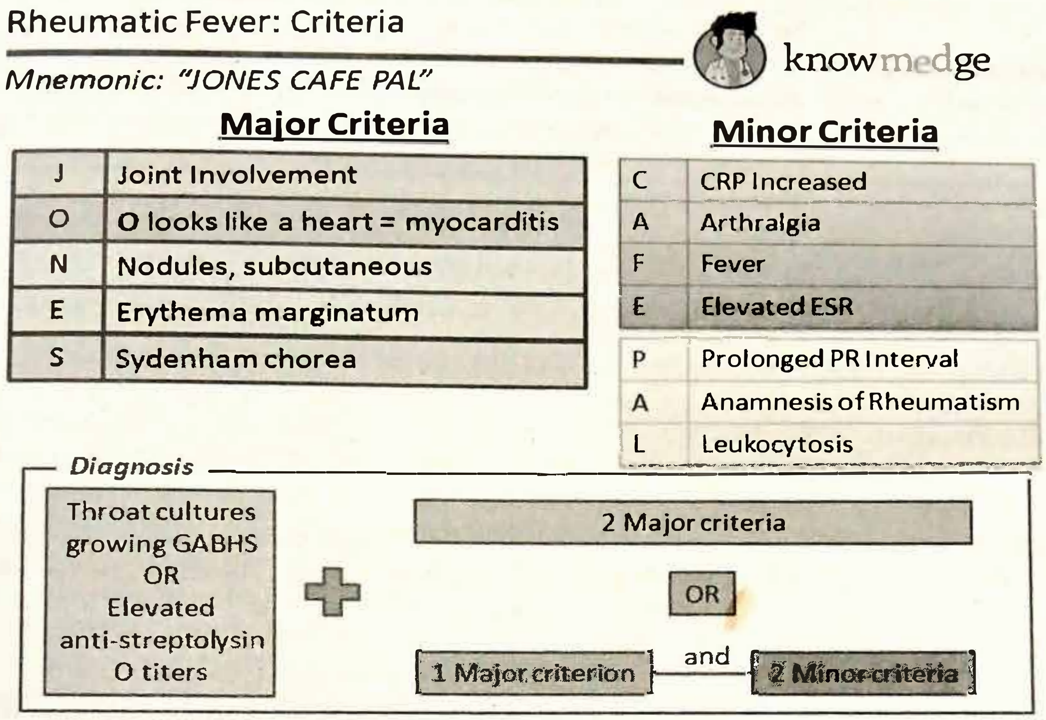
75. ASO TITER TEST IS USED FOR THE DIAGNOSIS= RHEUMATIC FEVER

ABOUT RHEUMATIC FEVER

- Rheumatic fever is a multisystem inflammatory disorder
- It usually occurs 1 to 4 weeks after an episode of pharyngitis caused by group-A β-hemolytic streptococci.
- Most often affecting children between 5 and 15 years of age.
- It is type-2 hypersensitivity reaction in which the antibodies develop against M-proteins of streptococci cross react with cardiac enzymes.
- **Aschoff bodies:**
  - Pathognomonic and characteristic lesion of rheumatic fever

  - Composed of multinucleated giant cells (Aschoff cells) surrounded by enlarged macrophages (Anitschkow cells) and T-lymphocytes.

- **Diagnostic criteria**:



Rheumatic Fever: Criteria

Mnemonic: "JONES CAFE PAL"

Major Criteria

J	Joint Involvement
O	O looks like a heart = myocarditis
N	Nodules, subcutaneous
E	Erythema marginatum
S	Sydenham chorea

Minor Criteria

C	CRP Increased
A	Arthralgia
F	Fever
E	Elevated ESR
P	Prolonged PR Interval
A	Anamnesis of Rheumatism
L	Leukocytosis

Diagnosis

Throat cultures growing GABHS OR Elevated anti-streptolysin O titers

+

2 Major criteria

OR

1 Major criterion and 2 Minor criteria

- Treatment/prophylaxis → **Penicillin**

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Antistreptolysin "O" titre (ASOT) test in serum is mostly used for the diagnosis of= Rheumatic fever
- The diagnostic laboratory test for the infection by Streptococcus beta hemolyticus is = ASO Titre
- A 13-year-old girl had shortness of breath during the school PT parade. She had complaints of sore throat and wrist joint pain in the past. The most appropriate investigation would be= ASO titre
- The early stage of the Aschoff body contains= Fibrinoid degeneration
- Typical picture of rheumatic heart disease was given in the scenario and mechanism of immune deposition was asked= Forms antibodies against tissues
- A 10-year-old girl with acute rheumatic fever died because of= Myocarditis
  - It is also asked as
    - Most common cause of death in rheumatic fever= Myocarditis
- Deteriorating cardiac status in a pregnant woman with rheumatic heart disease is most likely associated with= Mitral stenosis
- Patient with rheumatic fever plus endocarditis, long-term prophylaxis to prevent recurrence: Benzathine penicillin
  - It also comes as with different options
    - Drug prescribed for long-term treatment of rheumatic fever with endocarditis= Benzyl penicillin
    - Prophylaxis for endocarditis in a hypertensive, rheumatic heart disease patient undergoing dental extraction= Amoxicillin

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76. IN IV DRUGS ABUSERS = BACTERIAL ENDOCARDITIS (STAPH AUREUS)

Remember:

Acute Endocarditis	❖ Staphylococcus aureus (50% of cases). ❖ Commonly involves tricuspid valve Mnemonic: don't "**tri**" **drugs** ❖ **Tri**cuspid valve endocarditis is associated with IV **drug** abuse.
Sub-Acute (Bacterial) Endocarditis	❖ Caused by Streptococcus viridans (**more than 50% of cases**). ❖ This type of endocarditis tends to occur in patients with congenital heart disease or preexisting valvular heart disease, often of rheumatic origin. And occur in patients post-dental procedures
Nonbacterial (Marantic/Thrombotic)	❖ 2° to malignancy, hypercoagulable state, or lupus
Libman-**S**acks **E**ndocarditis	❖ Occurs in systemic lupus erythematosus (SLE). (**LSE** in **SLE**)
Other Forms	❖ S. Bovis (gallolyticus) is present in colon cancer ❖ S. epidermidis on prosthetic valves

NOW LET'S DISCUSS SOME PAPER MCQ'S

INFECTIVE ENDOCARDITIS

- A patient presented to OPD with complaints of fever for the last 7 days. On examination, there are skin spots and nail bed hemorrhages on both hands and a Grade-4 Diastolic Murmur. History is unremarkable. The patient is most likely suffering from = infective endocarditis.
- Large friable vegetations are present in = infective endocarditis.
- Most common condition that occurs in IV drug abusers is = infective endocarditis.
    - It also comes as
        - Intravenous drug abusers are most likely to suffer from = infective endocarditis.
        - The most likely cause of infective endocarditis in IV drug abusers is = Staphylococcus aureus.
        - Drug addict are prone to= Endocarditis
- A patient has fever, malaise, anemia, and weight loss for several weeks. On examination, splenomegaly and splinter hemorrhages are observed. The investigation to help diagnose the illness is = blood culture.
    - It is also asked as
        - The best investigation for diagnosing infective endocarditis is = blood culture.

SUBACUTE BACTERIAL ENDOCARDITIS

- A known case of rheumatic mitral stenosis developed fever, lassitude, and body ache after tooth extraction. Subacute bacterial endocarditis is suspected. The most likely organism present in blood culture = Streptococcus viridans.
    - It is also asked as
        - The most common cause of subacute bacterial endocarditis = Streptococcus viridans.
        - Organism most commonly causing subacute bacterial endocarditis = Streptococcus viridans.
- Patient with damaged heart valves developed endocarditis. The organism most likely is = Streptococcus viridans.

NON-BACTERIAL (MARANTIC) AND LIBMAN-SACKS ENDOCARDITIS

- Cause of Libman-Sacks endocarditis = SLE.
- Non-thrombotic bacterial endocarditis is frequently associated with = Terminal cancer.
- Non thrombotic bacterial endocarditis is frequently associated with=Terminal neoplasm
- Nonbacterial thrombotic endocarditis is due to = Terminal cancer.
- Nonbacterial endocarditis is seen in = Neoplasms.

PROPHYLAXIS FOR ENDOCARDITIS

- ❖ A 54-year-old man arrives at a dental clinic for a toothache. He has poor dental hygiene and is advised to undergo dental extraction of a molar tooth. He has a history of rheumatic heart disease and a prosthetic aortic valve and is allergic to penicillin. The drug of choice for prophylaxis of endocarditis in this patient = Vancomycin and gentamicin.
- ❖ Long scenario of a patient with poor dental hygiene, infective endocarditis. Patient is allergic to penicillin; prophylaxis medication is = Vancomycin + gentamicin (Ref MRCP notes and Oxford Med)
- ❖ Drug of choice for prophylaxis of endocarditis in a patient with penicillin allergy = Clindamycin.

MISCELLANEOUS

- ❖ Most common valve involved in endocarditis in IV drug users = Tricuspid.
    - o Remember In infective endocarditis:
        - ▪ Valve involved: Mitral valve > Aortic valve
        - ▪ The tricuspid valve is involved in more than 50% of cases of endocarditis in IV drug users, in whom endocarditis is most often caused by staphylococcal infection.
- ❖ In endocarditis, which valves are involved = Aortic and Mitral.
- ❖ In Libman-Sacks endocarditis, the heart valves characteristically affected = Mitral and Aortic
- ❖ . A long scenario of a schoolteacher who, after death, was diagnosed as a case of endocarditis with lymphocytic infiltration of cardiac tissues. Cause = Coxsackie virus.
- ❖ A 20-year-old man with rheumatic valvular heart disease has been running a low-grade fever for two weeks. In addition to a pan-systolic murmur, he is found to have splenomegaly and clubbing. The treatment should commence with = Inj. Penicillin and gentamycin.
- ❖ Pt has complaints of joint pain, and on X-ray, a large silhouette of the heart is seen. In childhood, she had recurrent attacks of pharyngitis due to Group B Streptococcus. The valve most commonly involved = Mitral.
- ❖ A patient has fever malaise anemia weight loss for several week on examination Spleenomegaly and splinter hemorrhage. Which investigation help you diagnose the illness=Blood culture

KNOW THE DIFFERENCE

- ❖ Female pt. has valvular heart disease, such pt. are at risk of developing infective endocarditis, which organism is commonly responsible= streptococcus viridians
- ❖ Female pt. with known valvular heart disease, now wants to insert IUCD, which bacteria could cause infective endocarditis= Enterococcus faecalis

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77. MOST COMMON ORGANISM IN INFECTIVE ENDOCARDITIS= STREP VIRIDIAN

KNOW THE DIFFERENCE

- ❖ Most common cause of Acute endocarditis = Staphylococcus aureus
- ❖ Most common cause of subacute endocarditis = Streptococcus viridans
- ❖ Most common cause overall (Controversial)
    - o As per Braunwald and cardiology textbooks----Most Common Cause of Infective Endocarditis (IE)--- Staphylococcus aureus
    - o Acc to MRCP notes, oxford medicine, BRS pathology & First aid strep Viridians is the most common cause more than 50% of cases
    - o Follow whichever you want for CPSP I would prefer Strep Viridians
- ❖ If asked about mortality ---then staph aureus (30%), strep viridians (5%)

---

78. EIGHT MONTHS AFTER PROSTHETIC VALVE REPLACEMENT, PATHOGEN RESPONSIBLE FOR INFECTIVE ENDOCARDITIS= STAPH AUREUS

REMEMBER FOR PROSTHETIC VALVE ENDOCARDITIS:

- ❖ Following prosthetic valve surgery Staphylococcus epidermidis is the most common organism in the first 2 months and is usually the result of perioperative contamination.
- ❖ After 2 months the spectrum of organisms which cause endocarditis return to normal, except with a slight increase in Staph. aureus infections

- A 54-year-old man arrives at a dental clinic for a toothache. He has poor dental hygiene and is advised to undergo dental extraction of a molar tooth. He has a history of rheumatic heart disease and a prosthetic aortic valve and is allergic to penicillin. The drug of choice for prophylaxis of endocarditis in this patient = Vancomycin and gentamicin.
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- After 2 months the spectrum of organisms which cause endocarditis return to normal, except with a slight increase in Staph. aureus infections

NOW LET'S DISCUSS SOME PAPER MCQ'S.

- A patient presented with valvular defect got his valve replaced after one month he developed tricuspid murmur, red sclera, and gingival spots. Diagnosis of infective endocarditis is made; the involved bacteria is= Staph epidermidis
- Eight Months after prosthetic valve replacement, pathogen responsible for infective endocarditis= Staph aureus

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79. CORRECT SEQUENCE OF EVENTS = DAMAGED VALVE, THROMBUS, PERFORATION, EMBOLI

- Correct Infective endocarditis sequence= **D**amage valve, **T**hrombus, **B**acteremia, **P**erforation (mnemonic----**DTBP)**

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80. CHF CAN BE BEST DIAGNOSED BY= BNP

NOTE THAT

Atrial Natriuretic Peptide (ANP)	B-Type (Brain) Natriuretic Peptide (BNP)
❖ Released from atrial myocytes in response to ↑ blood volume and atrial pressure	❖ Released from ventricular myocytes in response to ↑ tension ❖ Synthesized largely by the ventricles (as well as in the brain where it was first identified).
❖ Acts via cGMP	❖ Acts via cGMP
❖ Vasodilation ❖ Excretion of sodium and water by augmenting glomerular filtration rate ❖ Inhibiting sodium reabsorption in the proximal tubule, and Inhibiting release of renin and aldosterone	❖ Same effect as ANP ❖ Available in recombinant form (nesiritide) for treatment of HF. ❖ BNP blood test used for diagnosing HF (very good negative predictive value).

NOW LET'S DISCUSS SOME PAPER MCQ'S.

- Enzyme released in heart failure that also helps in its diagnosis = BNP
- Which of the following enzyme released in heart failure also helps in its diagnosis? = BNP
- In dehydration, increased plasma concentration of all except? = ANP
- Secretion of one of the following hormones is stimulated by extracellular fluid volume expansion: = Atrial natriuretic peptide (ANP)
- Hormone acting through cGMP = ANP
- Right Atrial Pressure when increased by balloon angioplasty results in increased release of= ANP
    - It is also asked as
        - Balloon dilation of atrium and increasing the pressure to 5 mmHg encourages release of= Atrial natriuretic peptide
- Which of the following decreases blood volume=ANP
- If atrial natriuretic peptide is used therapeutically, it will be beneficial in= Hypertension

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81. SODIUM RETENTION IN THE BODY IS A FEATURE OF = HEART FAILURE

PAST PAPER MCQS OF GENERAL FEATURES AND PATHOPHYSIOLOGY OF HEART FAILURE

- A 22-year-old male complained of shortness of breath during exercise. The most likely underlying cause for this patient's shortness of breath during exercise would be = Impaired left ventricular function
- In congestive heart failure, edema results from = an elevation of capillary hydrostatic pressure
- One of the following changes best describes the pathophysiology involved in the production of pulmonary edema in patients with congestive heart failure = Increased hydrostatic pressure
- A 58-year-old man is admitted to the hospital with acute heart failure and pulmonary edema. O/E

dyspneic and basal crackles. Which one of the following drugs given IV would be most useful in treating the pulmonary edema = Loop diuretic

- A pleural effusion with a specific gravity of 1.006 would most likely be the result of = Congestive heart failure
- The drug most appropriate as single drug therapy for mild congestive heart failure would be = An ACE inhibitor such as captopril
- Mannitol in heart failure patients may cause = Precipitating pulmonary edema
- Congestive heart failure does NOT cause = Enlarged spleen
- In pulmonary congestion due to mitral stenosis, the alveoli are lined by = Heart failure macrophages
    - It is also asked as
        - A patient died in ER with longstanding pulmonary congestion due to mitral stenosis. On autopsy, the alveoli will be lined by = Heart failure macrophages
- Transudate fluid secondary to heart failure in pleural tap shows = Few serosa cells
- Mechanism of formation of heart failure macrophages in chronic pulmonary congestion = Chronic passive congestion
- A 50-year-old alcoholic man with chronic liver enlargement and prominent neck veins showing centrilobular congestion and necrosis is most likely due to = Right heart failure
- Mechanism of edema in CHF = Increased capillary hydrostatic pressure
- 65 years old patient. AST and ALT raised, pitting edema grade 2 bilaterally and raised JVP. Diagnosis= Heart failure
- Pt with SOB and pink fluid with no RBC and WBC in alveoli occurs in= CCF
- A patient history of recent MI after which he develops shortness of breath upon lying and decrease urine output. O/E he has pedal edema, distended jugular pressure, basal crepitation, tender liver and shifting dullness. The most likely diagnosis is= Congestive cardiac failure

Past Paper MCQ'S of Medications in Heart Failure

- In CHF, captopril works as = Increases cardiac output
- Single best drug for mild CHF = ACEIs
- Mannitol given with caution in= CHF
    - It is also asked as
        - In a patient with heart failure, Mannitol should be given with caution because of risk of precipitating = Pulmonary edema
- Heart failure, JVP raised, bilateral basal crepts. Urea 90, Creat 2.0. Drug of choice from diuretics = Furosemide
    - It is also asked as
        - A patient known case of CCF was presented with shortness of breath. O/E he has basal crepts. Which one of the following is the immediate drug of choice = Loop diuretic
        - Pt with heart failure came to ER with complains of shortness of breath and basal crept. First line of treatment will be=Inj furosemide
        - A 58-year-old man is admitted to the hospital with acute heart failure and pulmonary edema. O/E dyspneic and basal crackles. Which one of the following drugs given IV would be most useful in treating the pulmonary edema = Loop diuretic
        - A 58-year-old man came to the ER with acute left ventricular failure. The most useful drug given IV is = Furosemide
        - A 65-year-old man presents with acute left ventricular failure. Drug treatment should commence with = IV furosemide
- A patient with CAD p/w orthopnea, dyspnea, BP 190/100. IV furosemide has been given. Next step in management should be = IV nitrates

Past Paper MCQS of Special Cases of Heart Failure

- 60-year male with normal past history now develops symptoms of LV failure and pulmonary edema without any previous illness and BP 125/85 mmHg. On X-ray cardiomegaly. Cause of heart failure is =

Bicuspid aortic valve

- A morbidly obese female died from heart failure. On autopsy, her heart was 900 gm (normal 400). On histology, there were adipose cells intermixed with cardiac cells. This is an example of = Fatty infiltration
- A patient with left ventricular hypertrophy presents to you with chest pain and mild shortness of breath. O/E BP 90/70, pulse 90. What shall be given to relieve pain = Nitrates
- A female with fever, SOB collapsed suddenly. On autopsy, dilated heart, pericardial effusion, and lymphocytes and necrosis. Cause is = Coxsackie B virus
- Young man with heart failure, B/L pleural effusion. In pleural tap, what will you see to consider it as transudate fluid secondary to heart failure= 2-3% lymphocytes.

PAST PAPER MCQS OF MISCELLANEOUS MCQS RELATED TO HEART AND RESPIRATORY SYMPTOMS

- A patient with a 1-year history of shortness of breath presents with a cough. O/E wheeze, hyperresonant chest, and decreased vocal fremitus. PFTs show decreased FEV/FVC and also decreased lung elastase. What is the cause of increased activity of neutrophil elastase = Nicotine
- A 3-year-old baby inhaled something after which he had SOB. O/E breath sounds on the right were normal while on the left side they were absent. CXR confirmed foreign body lodged in left lower bronchus. What is your diagnosis = Situs inversus

---

82. THE DEFICIENCY OF WHICH OF THE FOLLOWING IS ASSOCIATED WITH CARDIOMYOPATHY= THIAMINE

Remember

Congestive Or Dilated Cardiomyopathy	❖ Most common cardiomyopathy (90% of cases). ❖ Other etiologies include: (ABCD-P) ▪ Alcohol abuse (chronic), B1-Thiamine deficiency (beriberi heart-wet Beriberi), Coxsackie B virus myocarditis, Doxorubicin toxicity, Peripartum cardiomyopathy (associated with the latter stages of pregnancy) ❖ Takotsubo cardiomyopathy: ▪ Aka as stress cardiomyopathy or broken heart syndrome—ventricular apical ballooning likely due to increased sympathetic stimulation (e.g. stressful situations). ❖ Peripartum cardiomyopathy ----cardiomyopathy which occurs in last month of pregnancy or within the first five months postpartum
Restrictive/infiltrative cardiomyopathy	❖ The cause is infiltrative processes within the myocardium that result in stiffening of the heart muscle, which interferes with pumping action. ❖ This cardiomyopathy is exemplified by cardiac amyloidosis, which may result in both right- and left-sided heart failure
Hypertrophic Cardiomyopathy	❖ Autosomal dominant (most commonly due to mutations in genes encoding sarcomeric proteins, such as myosin binding protein C and β-myosin heavy chain) ❖ Gross characteristics include hypertrophy of all chamber walls, especially the ventricular septum (asymmetric septal hypertrophy). ❖ Myofibrillar disarray and fibrosis. ❖ Cardiomyopathy may result in left ventricular outflow obstruction, placing the patient in danger of syncope and even sudden death, which often occurs unexpectedly in young athletes ❖ Echo: (mnemonic: MR SAM ASH) ○ Mitral Regurgitation (MR) ○ Systolic Anterior Motion (SAM) of mitral valve ○ ASymmetric Hypertrophy (ASH) ❖ Treatment: ○ β-blockers (1st line) ○ Non-dihydropyridine CCBs (2nd Line) ○ Digoxin and spironolactone are contraindicated. ○ Implantable defibrillators (ICD) should be used in symptomatic ○ Surgical excision or alcohol ablation

NOW LET'S DISCUSS SOME PAPER MCQ'S.

- Hypertrophic cardiomyopathy is most likely due to = Myocyte disarray.
    - It also comes as
        - Present finding in hypertrophic cardiomyopathy = Myocyte disarray
- Calcium channel blocker indicated in the treatment of hypertrophic obstructive cardiomyopathy is = Verapamil.
- Septum-to-free-wall thickness of 3:1 indicates = Hypertrophic cardiomyopathy.
    - It also comes as
        - Hypertrophied walls of the ventricular septum seen in a 3:1 time ratio are characteristic of = Hypertrophic obstructive cardiomyopathy (HOCM).
- Feature of hypertrophic obstructive cardiomyopathy (HOCM) = Decreased stroke volume and impaired diastolic filling.
    - It is also asked as
        - In hypertrophic cardiomyopathy, the characteristic finding is = Decreased diastolic filling.
- Young athlete during exercise suddenly dies, possible reason = Hypertrophic obstructive cardiomyopathy.
- Drug of choice for hypertrophic obstructive cardiomyopathy = Verapamil.
- A 65-year-old man has had congestive heart failure with increasing pulmonary congestion and edema for the past year. He had been previously healthy all his life with no major illnesses. On physical examination, his blood pressure is 125/85 mmHg and he is afebrile. A chest radiograph shows cardiomegaly with a prominent left heart border and pulmonary edema. Laboratory studies show a serum glucose of 95 mg/dL and total serum cholesterol of 185 mg/dL. His serum creatine kinase is not elevated. Which of the following underlying diseases is he most likely to have? = Calcified bicuspid aortic valve.
- In dilated cardiomyopathy, increased stretch on the ventricular wall causes = Increased calcium influx during depolarization.
- A previously normal athlete presents to you with dizziness and history of episodes of loss of consciousness 2-3 time in the previous months. Echo showed increased heart size. What will be drug of choice for him= Beta blockers
- Which of the following causes increase myocardial oxygen demand= Increase contractility

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83. DRUG CONTRAINDICATED IN HYPERTROPHIC OBSTRUCTIVE CARDIOMYOPATHY= DIGOXIN

REMEMBER

- Other drugs that are contraindicated in HoCM are Nitrates, ACEi, inotropes
- While Drug of choice for Hypertrophic obstructive Cardiomyopathy= B blockers > Verapamil
- In hypertrophic cardiomyopathy, which of the following is present= Myocytes disarray

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84. IN EXERCISE, CARDIAC OUTPUT IS MAINTAINED BY=INCREASED VENTRICULAR CONTRACTILITY

NOTE ABOUT EXERCISE EFFECTS ON SYSTEMS

Exercise Effects on Body

On CVS system:

- ↑ blood flow will occur with
    - Central command (↑sympathetic outflow, ↓parasympathetic)
        - ↑HR, ↑Contractility→↑stroke volume, ↑cardiac output
        - Constriction of arterioles decreases TPR, inc Pulse pressure
        - Constriction of veins increases venous return
    - Local response:
        - Dilatation due to metabolites such as **(CHALK) C**O2, **H+**, **A**denosine, **L**actate, **K+**
        - Dilatation of skeletal arterioles→↓TPR

On Respiratory system:

- Inc expiration
- Hb-02 curve shifts to RIGHT
- Exercising muscle → ↑ CO_2 production and ↑ O_2 consumption.
  →↑Ventilation rate to match O_2 consumption and CO_2 production.
- In exercise → ↑ cardiac output as a result ↑ pulmonary blood flow→ ↑ V/Q(ventilation/perfusion) becomes more uniform from apex to lungs

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

EXERCISE PHYSIOLOGY MCQS

- A patient with low cardiac reserve is asked to perform an exercise tolerance test. Which of the following will most likely be observed= Failure of cardiac output to raise to meet the activity demands
- Which of the following parameters is decreased during moderate exercise= Total peripheral resistance (TPR)
- Increase in arterial pressure with decreased TPR is due to= Exercise
  - It is also asked as
    - Patient having increased right atrial pressure and increased systemic pressure with decreased venous resistance due to= Exercise
- A patient has increased right atrial pressure, increased systemic pressure, and decreased venous resistance due to? = Exercise
  - Know the difference
    - Decrease in mean arterial pressure and decrease in resistance to venous return are caused by= Hemorrhage
- Arterial blood pressure can be chronically elevated only by a change in= Total peripheral resistance
- During exercise increase, which of the following occurs=Increase stroke volume
- Which of the following causes hyperkalemia = Strenuous exercise
  - It also comes as
    - Potassium moves out into ECF due to= Strenuous exercise
- During exercise, where is blood flow increased= Skeletal muscles
- During exercise, where is blood flow decreased= Kidney (prefer splanchnic if kidney is not an option)
- After stress or exercise, what will be different in left and right systolic or diastolic duration= Decreased diastolic and increased systolic duration
- The most important subjective cause of a person feeling exhausted during exercise is= Increased heart rate
  - It is also asked as
    - After strenuous exercise, subjective feeling of exhaustion occurs due to = Increased heart rate
- A person had blood loss which caused a decrease in mean arterial pressure from 100 to 70 mmHg. The most likely change would be = Increased cardiac sympathetic efferent activity

RESPIRATORY CHANGES DURING EXERCISE

- A person doing regular exercise. What factor in this condition increases his respiratory rate= Proprioceptors
- An athlete involved in regular exercise. During exercise, the blood flow in all zones of the lung is similar to that of= Zone 3 of the lungs

EFFECTS OF EXERCISE ON HORMONE SECRETION

- The secretion of growth hormone is increased by one of the following factors: = Exercise
- Glucagon secretion is increased by= Exercise

FLUID AND ELECTROLYTE BALANCE DURING EXERCISE

- A man drinks 2 L of water to replenish the fluids lost by sweating during exercise. Compared with the situation prior to the period of sweating= His intracellular fluid volume will be greater
  - It also comes as
    - A person loses 2L of sweat while working and he drinks 2L of pure water. What change will occur in body= Decrease ICF osmolarity
      - It sometimes comes with different options so remember the sequence -----increase ICF volume > dec ICF osmolarity> Inc ECF volume
- During heavy exercise, increased loss of body water occurs through= Sweat
- After heavy exercise, what mechanism helps to conserve Na/water in an athlete= Renin-angiotensin-aldosterone mechanism
- In person with 2L of blood loss, the blood volume will be replaced back by= Cortical Collecting Tubule

OTHER EFFECTS OF EXERCISE

- During exercise, sympathetic stimulation of beta-adrenergic receptors causes= Increased cardiac activity (cardiac acceleration)
- During strenuous exercise most likely: = Ventilation rate and oxygen consumption increase to the same extent
- During exercise, the coronary blood flow increases due to= Release of vasodilator metabolites in the myocardium
- The organ that undergoes blood vessel dilation in response to exercise via the sympathetic nervous system is= The heart
- During exercise, the blood flow is minimally changed in= Brain
- A person performing heavy exercise will have a resting heart rate= Below 60 beats/min
- During exercise, there is decreased blood flow to= Kidney (kidney > splanchnic---if kidney is not in option prefer splanchnic)
  - Also, remember
    - ✓ In exercise, blood flow is increased to which organ via stimulation of sympathetic system=Skin

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85. CAUSE OF EDEMA IN CONGESTIVE HEART FAILURE= INCREASE HYDROSTATIC PRESSURE

BASIC CONCEPTS

- **EDEMA PATHOPHYSIOLOGY:**
  - Results from imbalances in Starling forces:
  - Increased hydrostatic pressure--- Pushes fluid out of capillaries (e.g., CHF).
  - Decreased oncotic pressure--- Reduces fluid reabsorption (e.g., hypoalbuminemia).
  - Lymphatic obstruction--- Prevents fluid clearance
- **HYDROSTATIC PRESSURE AND EDEMA**
  - Increased hydrostatic pressure is a common cause of edema, particularly in conditions like congestive heart failure (CHF) or cardiac failure, where fluid is forced out of the capillaries into the interstitial spaces.
- **DECREASED COLLOID OSMOTIC PRESSURE (ONCOTIC PRESSURE)**
  - Due to low plasma protein levels (mainly albumin) leads to edema because plasma proteins help retain water in the vascular compartment
- **GLOMERULAR FILTRATION AND PRESSURES**
  - Glomerular filtration rate (GFR) depends on the balance between hydrostatic and oncotic pressures.
  - ↑ P_{BS} (Bowman space hydrostatic pressure) --- ↓ GFR
  - ↑πGC (Capillary oncotic pressure) --- ↓ GFR
  - Afferent arteriole constriction --- ↓ GFR
  - Efferent arteriole constriction --- ↑ GFR
  - ↑ Plasma protein concentration --- ↓ GFR
  - ↓ Plasma protein concentration --- ↑ GFR

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

HYDROSTATIC PRESSURE

- Pulmonary edema develops due to= Increased hydrostatic pressure.
- Increased hydrostatic pressure occurs in= CHF.
- An old male patient with DM and HTN has lower limb edema and bilateral effusion. The possible etiology is= Increased hydrostatic pressure.
    - It also comes as
        - Increased hydrostatic pressure most commonly= Can result from cardiac failure.
        - A 60-year-old man hypertensive and having ischemic heart disease developed pedal edema. What is cause of edema=Increase hydrostatic pressure
        - Which of the following is a cause of edema in patient with heart failure=Increase hydrostatic pressure
        - In congestive heart failure, edema results from=An elevation of capillary hydrostatic pressure
        - One of the following changes best describes the pathophysiology involved in production of pulmonary edema in patients with congestive heart failure= Increased hydrostatic pressure
- Edema is caused by= Increased hydrostatic pressure.
- Left ventricular failure tends to cause an increase in= Pulmonary capillary pressure.
- The likely effect of increased hydrostatic pressure in the kidneys= Constriction of afferent arterioles.

COLLOID OSMOTIC PRESSURE/ONCOTIC PRESSURE

- Cause of edema in a child with periorbital edema and proteinuria more than 3.5 gm= Decreased colloid osmotic pressure.
- A 5-year-old child with generalized edema and proteinuria of 3.6 gm in 24 hours. The most underlying mechanism of edema is= Decreased colloid osmotic pressure.
- A patient with jaundice, generalized edema, and ascites. The massive accumulation of fluid in the abdomen is the result of= Decreased colloid osmotic pressure.
- Formation of interstitial fluid increases with decreased= Plasma colloid osmotic pressure.
- Fluid accumulation due to decreased oncotic pressure is seen in= Decreased oncotic pressure.
- Plasma colloid osmotic pressure is primarily regulated by= Albumin.
- In a patient with chronic liver disease, plasma colloid osmotic pressure decreases due to decreased plasma concentration of= Albumin.
- Cause of edema in a child with proteinuria and good steroid response= Decrease in oncotic pressure.
- What is the approximate oncotic pressure exerted by plasma proteins in the circulatory system= 25 mmHg.
- Lymphatic flow decreases due to increase in= capillary oncotic pressure
    - Inc in Hydrostatic pressure favors filtration
    - Inc in capillary oncotic pressure or colloid osmotic pressure opposes filtration
    - Reference BRS 6th edition page 92

GLOMERULAR CAPILLARY PRESSURE

- Glomerular capillary hydrostatic pressure decreases by= 10% when BP decreases by 10%.
- An increased glomerular filtration rate by a drug is most likely by= Increasing the filtration coefficient $^{(Kf)}$
- GFR increases with: Decrease in colloid oncotic pressure.
- Increased urine output in a hypertensive patient is due to= Increased glomerular capillary pressure $^{+}$ increased GFR.
- When GFR increases, proximal tubular reabsorption of salt and water is increased by= Increased peritubular oncotic pressure.
- Plasma proteins are filtered through the glomerular membrane only in minute amount because their filtration is opposed mainly by=Strong negative charges in proteoglycans of the basement membrane
- There is very little protein in the glomerular filtrate. This is because: A. All serum proteins are too large to fit through the glomerular pores= Of the combination of pore size and negative charges lining the pores

OTHERS

- ❖ A 50-year-old man known to have hepatoma develops dependent edema with dilated abdominal walls veins. The most likely structure involved in this patient is=Inferior vena cava
- ❖ Which of the factors do not cause increase in edema=Arteriolar constriction

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86. THE MOST PROBABLE CAUSE OF EDEMA IN LIVER CIRRHOSIS IS DUE TO DEFICIENCY OF= ALBUMIN

KNOW THE DIFFERENCE, IT USUALLY COMES WITH DIFFERENT OPTIONS

- ✓ A patient with jaundice, generalized edema and ascites. The massive accumulation of fluid in abdomen is the result of=Portal Hypertension (Portal HTN > Hypoalbuminemia)
- ✓ A known CLD patient with jaundice, generalized edema and ascites. The massive accumulation of fluid in abdomen is the result of= Decreased colloid osmotic pressure
- ✓ A patient with severe malnutrition presented with jaundice, generalized edema and ascites. The massive accumulation of fluid in abdomen is the result of= Decrease albumin

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87. DIFFERENCE B/W ANAPHYLACTIC AND HYPOVOLEMIC SHOCK IS= CARDIAC OUTPUT

ABOUT SHOCK

- ❖ Inadequate organ perfusion and delivery of nutrients necessary for normal tissue and cellular function.

Features	Hypovolemic	Cardiogenic	Obstructive	Septic shock
Caused By	Hemorrhage dehydration. burns	Acute MI, HF. valvular dysfunction, arrhythmia	Cardiac tamponade, pulmonary embolism tension pneumothorax	Sepsis
Skin	Cold, clammy	Cold, clammy	Cold, clammy	Warm
PCWP (Preload)	↓↓	Can be ↓ or ↑	Can be ↓ or ↑	↓
Cardiac Output	↓	↓	↓	↑
Heart Rate	↑	↑	↑	↑
Systemic Vascular Resistance (Afterload)	↑	↑	↑	↓
Oxygen Delivery	↓	↓	↓	↑

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

HYPOVOLEMIC SHOCK

- ❖ A young man in RTA had multiple bone fractures and lost enough blood. He was brought to ER, was pale with BP 90/60 and tachycardic. Most likely cause is= Hypovolemic shock
  - o It is also asked as
    - ▪ An old patient after abdominal surgery develops abdominal distention. On examination, he was pale, BP low, and tachycardiac. The most likely diagnosis is= Hypovolemic shock
    - ▪ The likely cause of shock resulting in the death of a patient after surgery for intestinal stricture= Hypovolemic shock
    - ▪ Most likely cause of shock in a pelvic fracture after RTA= Excessive blood loss
    - ▪ The most likely cause of shock in a patient with a fractured pelvis is= Excessive blood loss
    - ▪ A 45-year-old male presented to ER with a fracture of the pelvic bone in RTA with shock. Most likely cause of shock is= Excessive blood loss
- ❖ The condition of a young male patient deteriorated drastically 2 hours after tonsillectomy. The most likely pathophysiological cause of his condition is= Hypovolemic shock

- The best parameter for fluid resuscitation in hypovolemic shock is= Increase in urine output
    - It is also asked as
        - The most likely effect following a severe episode of hypovolemic shock is= Oliguria
        - A patient came in emergency in a state of shock. He will not have one of the following clinical signs= Increased urinary output
- A young man underwent a tonsillectomy operation. 6 hours after the operation, the patient starts bleeding. The best way to assess the effect of blood loss is: = Pulse rate
- After blood loss in a normal person, the plasma protein loss is restored in: = 3 - 4 days
- In hypovolemic shock, the increased thirst is due to stimulation of the hypothalamic thirst center by= Angiotensin II
- A young soldier is hit by a sharp splinter in the neck. He bled profusely from the wound and is brought to the hospital in a state of shock. The blood product(s) most suitable for immediate transfusion would be= Up to 3 days old whole blood
    - It is also asked as
        - The most appropriate blood product(s) for immediate transfusion in a shock patient is= Whole blood
- Immediate management of a patient with multiple pelvic fractures, blood loss, and shock includes= IV fluids
- Vessel likely injured in hemorrhagic shock after a stab wound in the abdomen= Inferior vena cava (IVC)

Cardiogenic Shock

- A 62-Year-old storekeeper collapses in his shop. The patient was most likely suffering from= Cardiogenic shock
- In myocardial infarction, which type of shock is seen= Cardiogenic shock
    - It is also asked as
        - Cardiogenic shock is commonly caused by= Myocardial infarction

Anaphylactic Shock

- Anaphylactic shock is associated with= Bronchospasm
- Degranulation of basophils and mast cells causes what type of shock= Anaphylactic shock
- A patient in shock with vascular disease. Neutrophils, basophils, and mast cell destruction. Types of shock= Anaphylactic
- A patient with anaphylactic shock compared to hypovolemic shock most likely has one of the following= Cardiac output is higher than normal
    - It also comes as
        - Anaphylactic shock differs from hypovolemic shock by= Increase in cardiac output

Septic Shock

- A woman after hysterectomy for benign ovarian cyst presented with pneumonia and was admitted. On sputum culture/gram stain, gram-negative rods were identified. On the 4th day of admission, she goes into shock. What is the mechanism of this shock= Increased vascular permeability
    - It is also asked as
        - A 60-year-old male diabetic was admitted with pneumonia. Sputum culture revealed growth of gram-negative rods. His blood sugar level was normal. On the 6th day, he developed a 'shock' like state. The most likely underlying cause for this condition is= Increased vascular permeability
- Type of shock in a female with recurrent UTI, fever, and hypotension= Septic shock
- The most common complication of septic shock is= Disseminated intravascular coagulation (DIC)
    - It is also asked as
        - Poor prognostic factor in septic shock patient is= DIC
- Vasodilatation and hypotension are features of which type of shock= Septic shock
- Following are the special features of septic shock EXCEPT= Marked peripheral vasoconstriction

- The most important physical sign differentiating septic shock from hypovolemic shock is= Body temperature

Neurogenic Shock

- A woman after RTA with warm extremities and inability to feel below the waist likely has what type of shock= Neurogenic shock
- Neurogenic shock occurs due to= Loss of vasomotor tone
    - It also comes as
        - A patient having spinal anesthesia goes into shock. The most likely cause of this type of shock is: Sudden loss of vasomotor tone
- Neurogenic shock associated with= Decrease systemic filling pressure
- Hemisection with total spinal section is differentiated by= Spinal shock

Toxic Shock

- A patient after accidental bruises on the thigh presents to you in the ER. On examination, the wound is foul-smelling, and the patient is hypotensive. Diagnosis= Toxic shock syndrome
- A young boy developed fever, hypotension, and erythematous patches all over the trunk and limbs. Toxin involved is= Erythrogenic toxin (Toxic shock syndrome/scarlet fever)
- DIC is caused by= Endotoxin shock
- A patient with a lacerated wound on the thigh 1 week before presented now with foul-smelling discharge from the wound. On examination, he was hypotensive, tachycardiac, and febrile. What is the likely diagnosis= Toxemic shock

General

- In the early stage of shock, aerobic to anaerobic metabolism occurs due to= Reduced perfusion
- A person is in a complete shock state and his compensatory mechanisms have failed. What type of acid-base imbalance will be present in him= Metabolic acidosis with respiratory acidosis
- An unconscious boy of 11 years is brought to the emergency department of a hospital in a state of shock. The doctor on duty is unable to find any vein. The vein of the lower limb most likely to be chosen for venesection is= Great saphenous vein
- Regarding dopamine, the INAPPROPRIATE statement is= Is contraindicated in septic shock
- If the heart, after pumping, were to be stopped to ensure that the circulatory system becomes static, the pressure measured in the rest of the body is= Mean systemic filling pressure

Know the Difference

- A 30-year-old male was brought to emergency in a state of cardiogenic shock. The drug you would like to use first would be= Dopamine
    - It also comes as
        - 50 years old presented in emergency department with failing heart. Which drug of choice should be given= Dopamine
- A patient brought to ER in a state of shock (un-recordable BP) with heart failure. Which neurotransmitter drug should be given=Nor-Epinephrine
- A 50-year-old man is brought to the emergency room with coma. His heart rate is 45 and has BP of 80/40 mmHg. He is sweating and salivating profusely. Which of the following treatment is indicated= Atropine
- A lady presented with 42 Heart rate, 90% O2 saturation and chest pain. After O2 what should be given= Atropine
- Epinephrine is not given for hypotension in a patient who is already taking= Amitriptyline
- Which of the following drugs increases chronotropic and ionotropic effects of the heart= Glucagon
- The neurotransmitter that can relieve a failing heart in shock is= Epinephrine

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88. THE MAJOR LIPOPROTEIN SOURCE OF THE CHOLESTEROL USED IN CELLS IS= LDL

About Lipoproteins

- Lipoproteins have been classified on the basis of their densities into five major classes:
  - Chylomicrons--- Delivers dietary TGs to peripheral tissues
  - Very low-density lipoproteins (VLDL)--- Delivers hepatic TGs to peripheral tissue
  - Intermediate-density lipoproteins (IDL)
  - LDL
    - LDL is bad because it enables excess cholesterol to build up in the blood
    - Mnemonic LDL is Lousy.
  - High-density lipoproteins (HDL)
    - HDL is good because it carries extra cholesterol back to the liver where it can be eliminated.
    - Mnemonic: HDL is Healthy
- Note these
  - Lipoprotein with highest TG = Chylomicron > VLDL > LDL > HDL
  - Lipoprotein with highest Cholesterol= LDL > VLDL > HDL > Chylomicron
  - lipoprotein with highest Protein= HDL > LDL > VLDL > Chylomicron
  - Lipoprotein with highest Phospholipids= HDL > LDL > VLDL > Chylomicron
- Familial Hypercholesterolemia
  - Type I Familial Hyperlipoproteinemia is due to deficiency of lipoprotein lipase or Apo C II with increased chylomicrons and triglycerides
  - Type II Familial Hyper cholestrolemia is due to defective LDL receptors with high LDL and cholesterol levels

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

LIPOPROTEINS: CONTENT AND CHARACTERISTICS

- Which one of the following lipoproteins has the highest phospholipid content = HDL
- Which one of the following lipoproteins has the highest protein content? = HDL
  - It also comes as
    - Lipoprotein with the highest fraction of protein is = High-density lipoproteins (HDL)
- Which lipoprotein is found in abundance in blood = HDL
- Lipoprotein fraction with the highest content of cholesterol is = LDL
  - It also comes as
    - Which lipoprotein is rich in cholesterol = LDL
    - The major lipoprotein source of cholesterol used in cells is = LDL
- For the transport of lipids, the highest triglyceride content is in = Chylomicrons
- A 10-year-old child presents with xanthomas on the extensor surfaces of his forearms. Laboratory studies demonstrate a total serum cholesterol of 820 mg/dL. The child's mother and maternal grandfather also have elevated serum cholesterol. This patient most likely has mutations in the gene that encodes the following proteins involved in lipid metabolism = Low-density lipoprotein (LDL) receptor

HYPERLIPIDEMIA

- Type 1a-hyperlipidemia occurs due to = Decrease in lipoprotein lipase
- Type 1 Hyperlipidemia has increased levels of = Chylomicron, Triglycerides, and cholesterol
- Which lipid is commonly associated with an increased risk of ischemic heart disease = Low-density lipoprotein (LDL) cholesterol
  - It is also asked as
    - Which of the following is associated with increased risk of death in a cardiac patient with a positive family history of hyperlipidemia? = LDL
- Factor inhibiting fibrinolysis related to coronary artery disease = LDL-C
- Lack of LDL receptor occurs in which type of Hyperlipidemia = Type 2

HORMONES AND ENZYMES INVOLVED IN LIPID METABOLISM

- The hormone that increases the activity of lipoprotein lipase = Insulin
- Heparin helps to remove fats from the plasma because it = activates the enzyme-lipoprotein lipase
- The major mechanism of action of gemfibrozil is = Increased lipid hydrolysis by lipoprotein lipase
- Which enzyme breaks down plasma triglycerides = Lipoprotein lipase
- A 56-year-old executive after eating a burger with fries, gets his lipid profile done. After centrifuge, his plasma appears milky white. This is due to = Chylomicrons
- Regarding Triglycerides = Are carried in the plasma by lipoproteins
- Lipoprotein secreted by the liver drains directly into the = Space of Disse

GASTROENTEOROLOGY

89. WHICH INHIBITS STOMACH EMPTYING = CCK

REMEMBER (ESPECIALLY THE BOLD LETTERS)

Substance	Source	Stimulus For Secretion	Action
❖ Gastrin	❖ G cells (antrum of stomach, duodenum)	❖ Secreted by • Small peptides and amino acids e.g. phenylalanine and tryptophan • Distention of stomach • Vagus via gastrin-releasing peptide (GRP) ❖ Inhibited by • H^+ in stomach • somatostatin	❖ **Increases Gastric H^+ secretion**
❖ CCK	❖ I cells (duodenum, jejunum	❖ Small peptides and amino acids ❖ Fatty acids	❖ **Stimulates contraction of gallbladder** ❖ **Inhibits gastric emptying**
❖ Secretin	❖ S cells of duodenum	❖ H^+ in duodenum ❖ Fatty acids in duodenum	❖ Increases HCO3 secretion ❖ **Decreases Gastric H^+ secretion**
❖ GIP (glucose-dependent insulinotropic peptide)	❖ Duodenum and jejunum	❖ Fatty acids, amino acids, and oral glucose	❖ ↑ Insulin secretion ❖ ↓ Gastric H^+ secretion

NOW LET'S DISCUSS SOME PAPER MCQ'S

GASTRIN

- ❖ Gastrin is released from = Gastric antrum
- ❖ The main action of gastrin is = Stimulation of gastric acid and pepsin secretion
  - o It also comes as
    - ▪ Gastrin main function is to stimulate which of the following = HCl and Pepsin secretion
- ❖ Gastrin secretion is mainly Increased by = ingestion of proteins
  - o It is also asked as
    - ▪ Potent stimulator of gastrin release is = Protein
    - ▪ Gastrin acid secretion is maximally stimulated by = Protein
- ❖ Gastrin secretion is decreased by = Somatostatin
  - o It is also asked as
    - ▪ Gastrin secretion is inhibited by = Secretin
- ❖ Gastrin secretion not affected by = Alcohol
  - o Remember: Beverages with a higher ethanol content (whisky, gin, cognac) do not stimulate gastric acid secretion or release of gastrin

- Gastrin secretion increased by = Stomach distention
- Decrease pH causes = Gastrin secretion inhibited
- Gastric motility/secretion is increased by = Gastrin
    - It also comes as
        - Which of the following increases gastric motility = Gastrin
        - Which one of the following hormones increases gastric emptying = Gastrin
        - What stimulates gastric motility= Gastrin
- Patient is using antacid due to increased acid secretion. The hormone responsible for gastric acid release is = Gastrin
- A patient had abdominal pain for which MRI was done. It shows a duodenal mass suspected to be cancer. The enzyme highly secreted in such a case is = Gastrin
- Which of the following stimulates gastric motility, secretion, and emptying via the activation of the pyloric pump, relaxation of the pylorus, and increased lower esophageal sphincter pressure? = Gastrin

SECRETIN

- Secretin action on pancreatic secretion= Increase pancreatic HCO3 secretion
- Which hormone inhibit the action of gastric acid secretion=Secretin
    - It also comes as
        - One of the following will inhibit gastric secretions = Secretin
- Insulin secretion is increased due to which of the following=Secretin
- Stimulus for Secretin secretion= Fatty acids in duodenum
    - It also comes with different options
        - In the gastrointestinal tract, the major stimulus for the release of secretin is = HCl in duodenum
- In the regulation of pancreatic secretion, the stimulus which mainly causes secretion of large quantities of sodium bicarbonate solution by pancreatic ductal epithelium and almost no secretion of enzyme is = Secretin

VASOACTIVE INTESTINAL PEPTIDE (VIP)

- Which hormone decreases contraction of esophagus, stomach, and gallbladder? = Vasoactive intestinal peptide (VIP)
    - It is also asked as
        - Which hormone relaxes the muscle of the stomach, esophagus, and intestine? = Vasoactive intestinal peptide (VIP)
        - Opening of the lower esophageal sphincter is mediated by = Vasoactive intestinal peptide (VIP)
- Increased salivation by the parasympathetic system is due to = Vasoactive intestinal peptide (VIP)
    - It is also asked as
        - Increased salivary secretions occur through = VIP

MOTILIN

- Which hormone increases gastric emptying? = Motilin
- The hormone involved in the initiation of the migrating motor complex is = Motilin

CCK

- Which of the following Hormone increases Intestinal Motility = CCK
    - It is also asked as
        - Action of CCK = Increase Intestinal motility
- After a late-night dinner mainly of fatty meal, the patient develops pain at supper. Hormone responsible for delayed gastric emptying is = CCK
    - It also comes as
        - Hormone responsible for bloating and delayed gastric emptying = CCK

    - The hormone which serves to inhibit gastric emptying when excess quantities of chyme (especially fatty chyme) enters the duodenum from the stomach is = Cholecystokinin
    - Delay in the rate of gastric emptying is due to the action of = Cholecystokinin
    - Which hormone decreases gastric emptying after a fatty meal? = Cholecystokinin
- Regarding exocrine pancreatic secretions = Secretion increased by CCK
- Which of the following increase pancreatic secretion and releases Ca from sarcoplasm = CCK
- A man takes fat-rich meal. The digestion and absorption of this meal in the small intestine is facilitated by = Cholecystokinin
  - It also comes as
    - Which of the following aids in fat absorption and digestion = Cholecystokinin
- Cholecystokinin has some gastrin-like properties because both most likely have five identical C-terminal amino acids = Have five identical C-terminal amino acids
- The GIT hormone increasing the contraction of gall bladder is = Cholecystokinin

OTHERS

- Enzyme secreted by small bowel= Enterokinase
  - It also comes as
    - The enzyme Enterokinase activates which of the following=-Trypsinogen
    - The zymogen form of trypsinogen of pancreatic juice is converted to 'active' trypsin by = Enterokinase
- Chief pancreatic enzyme responsible for protein digestion is=Trypsin
- Normal person with decreased HCL. What will happen=Abnormal protein digestion
- Gastric acid secretion is mediated by=H2 Receptors
- Pharmacologic blockade of histamine H_2 receptors in the gastric mucosa = Inhibits both gastrin-induced and vagally mediated secretion of acid
- A GIT secretion (juice), on analysis, is found to be rich in bicarbonate. Its secretion is stimulated by the vagus nerve and the hormones gastrin, secretin, and cholecystokinin. The secretion is most likely to be = Pancreatic juice
- Removal of the pyloric sphincter is associated with = An increase in the rate of gastric emptying of solids
  - It also comes as
    - Removal of the antrum is associated with = An increase in the rate of gastric emptying of solids
    - The most likely change after resection of the fundus and upper part of the corpus of the stomach is = Loss of receptive relaxation of the stomach
- Parietal cells release = Intrinsic factor and hydrochloric acid (HCl)
- Hypoglycemia increases = Glucagon
- The pressure on lower esophageal sphincter constriction is increased due to = Anticholinergic drugs
- A potent stimulator of insulin secretion from pancreatic islets is = Gastric inhibitory peptide
- Oral glucose/carbohydrate load increases which hormone = Gastric inhibitory peptide
- In normal persons decrease acid secretion causes what= Abnormal protein digestion
  - Remember: Because acid activate pepsinogen into pepsin which in turn digest protein so absence of acid would affect protein digestion)

90. HORMONE RESPONSIBLE FOR BLOATING AND DELAYED GASTRIC EMPTYING = CCK

IN SIMPLE WORDS:

- ✓ CCK decreases stomach contractility and increases intestinal motility
- ✓ Gastrin increases both gastric and intestinal motility
- ✓ Secretin decreases both intestinal as well as gastric motility

KNOW THE DIFFERENCE—WITH THESE PAPER MCQS

- Gastric emptying is delayed by= CCK

- Gastric emptying increased by=Gastrin
- Decreased gastric H+ secretions by= Secretin
- Increased gastric H+ secretions by= Gastrin
- After a late-night dinner mainly of fatty meal, the patient develops pain at supper. Hormone responsible for delayed gastric emptying is = CCK
- Small intestinal peristalsis is most likely enhanced by = Cholecystokinin

91 THORACIC VAGOTOMY RESULTS IN = DECREASE IN GASTRIN SECRETION

KNOW THIS

- Thoracic vagotomy, the cutting of vagus branches in the thorax, results in decreased gastrin secretion.
- Truncal vagotomy, the cutting of the main vagal trunks at the diaphragm, delays gastric emptying, especially for solids.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Thoracic Vagotomy results in= Dec Gastrin secretion
    - It also comes as
        - Which of the following is the effect of thoracic vagotomy= Decreased acid secretion
- Truncal Vagotomy often causes= Delay gastric emptying
- Vagotomy done its effect= Decreased gastric acid and pepsin secretion
- Gastric mucosal regeneration=Vagotomy
- Receptive relaxation of the stomach is abolished by = Vagotomy
- Indication of Truncal vagotomy in case of peptic ulcer disease=To decrease Gastric acid and pepsin secretions
- Which GI secretion is most isotonic, has high HCO3 and has its production inhibited by vagotomy=Pancreatic secretion

92. MAIN ACTION OF GUT SOMATOSTATIN IS TO MAINLY INHIBIT= CCK

REMEMBER THIS

- Pancreatic somatostatin inhibits
    - Insulin
    - Glucagon
- Gut somatostatin inhibits
    - Gastrin
    - CCK

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Main action of gut somatostatin is to mainly inhibit= CCK
- What is the role of giving somatostatin in pancreatic fistula= Decreases secretion
    - It is also asked as
        - In pancreatic fistula, somatostatin helps by = Decreasing secretions
- The most potent inhibitor of insulin is = Somatostatin
    - It also comes as
        - Somatostatin decreases insulin in which of the following fashions = Paracrine
        - Somatostatin acts on beta cells by = Paracrine

93 WHAT DECREASES APPETITE= LEPTIN

KNOW THIS

- Leptin Lowers appetite

- Ghrelin Gains appetite
- Leptin mechanism of action= Enzyme linked

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94 ANTACID DECREASING GASTRIC MOTILITY = ALUMINUM HYDROXIDE

REMEMBER THIS

- Aluminum decreases motility causes constipation
- While Mg increases motility causes diarrhea
- Which drug acts does not act via receptor in the body= Aluminum hydroxide

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95. PEPTIC ULCER PROFUSELY BLEEDING FROM POSTERIOR WALL OF DUODENUM WHICH ARTERY INVOLVED = GASTRODUODENAL ARTERY

REMEMBER THE DIFFERENCE BETWEEN DUODENAL AND GASTRIC ULCER

Duodenal ulcers	Gastric ulcers
❖ Can occur in any age group but most common in 30-55 years	❖ Can occur in any age group but most common in 50-75 years
❖ Most common area- first portion of duodenum	❖ Most common area-- lesser curvature within the antrum
❖ Duodenal ulcer pain Decreases with food	❖ Gastric ulcer pain Grows with food
❖ Virtually Never malignant	❖ Associated with increased risk of malignancy
❖ Hemorrhage → (posterior>anterior).→from erosion of Gastroduodenal artery	❖ Hemorrhage → from erosion of left gastric artery

NOW LET'S DISCUSS SOME PAPER MCQ'S

GASTRIC ULCER AND PEPTIC ULCER

- The most common cause of gastric ulcer is = H. pylori
- Most common site of Gastric Ulcer= Antrum (lesser curvature within antrum)
  - This also come as
    - Most common site of Stomach ulcer= Lesser curvature
    - Gastric ulcer mostly occurs at which part of stomach = Lesser curvature
- Indication of Truncal vagotomy in case of peptic ulcer disease=To decrease Gastric acid and pepsin secretions
- A 37-year-old man has had nausea and vomiting for 5 weeks. He experienced an episode of hematemesis yesterday. On physical examination, he has no abnormal findings. Upper GI endoscopy is performed, and there is a 1.5 cm diameter lesion in the gastric antrum with loss of the epithelial surface. These findings are most typical for which of the following pathologic processes= Ulcer

DRUGS

- Patient is a known case of gastric ulcer. Now presents in OPD with complains of joint pain. Which drug is safe for her= Celecoxib
- A patient with a history of peptic ulcer disease comes with lower molar pain. Analgesia of choice should be= Acetaminophen
- H2 blocker treatment not effective in= Zollinger Elson syndrome
- Aspirin shouldn't be given In= Peptic Ulcer

ARTERIES

- The most likely source of bleeding in a duodenal ulcer is: = Posterior duodenal ulcer with erosion of gastroduodenal artery
  - It also comes as

- The most likely cause of bleeding in a chronic smoker with duodenal ulcer is = Posterior duodenal ulcer with erosion of gastroduodenal artery
- An old man of 65 years presented with severe hematemesis. Emergency endoscopy revealed a large posterior wall ulcer in the first part of the duodenum with a visible pulsatile clot in its base. The most likely vessel to cause hematemesis is: = Gastroduodenal artery
- Which artery should be ligated in proximal duodenal ulcer = Gastroduodenal artery
- Hemorrhage due to perforation of the posterior part of the first part of the duodenum, which artery is involved = Gastroduodenal artery
- - A 60-year-old male executive who has a history of chronic duodenal ulcer was admitted to the ER exhibiting a sign of severe internal hemorrhage. He was quickly diagnosed with perforation of the posterior wall of the first part of the duodenum and erosion of the artery behind it by the gastric expellant. The artery most likely involved is = Gastroduodenal artery
- A patient has penetrating ulcer of the posterior wall of the first part of the duodenum. Which blood vessels is subject to erosion = Gastroduodenal artery

- Which artery lies posterior to the first part of the duodenum = Gastroduodenal artery
- Gastroduodenal artery is a branch of = Hepatic artery
- A posterior wall stomach ulcer likely causes bleeding by damaging the = Splenic artery
- Damage to the fundus of the stomach will cause bleeding from = Short gastric arteries
- Short gastric artery arises from = Splenic artery
- The most common site of a duodenal ulcer is the = duodenal bulb
- The major cause of bleeding from a gastric ulcer is erosion of the = left gastric artery
  - It also comes as
    - A patient of chronic liver disease suffered hematemesis. Which vessel is involved = Left gastric vein
    - Hemorrhage due to perforation of the lesser curvature of the stomach, which artery is involved = Left gastric artery

BLEEDING

- A perforating ulcer in the posterior wall of the stomach most likely leaks into = Lesser sac
  - It also comes as
    - A perforating ulcer in posterior wall of stomach most probably leaks into which of the following causing peritonitis to develop initially= Lesser sac
- The most common site of a duodenal ulcer is the = duodenal bulb
- The major cause of bleeding from a gastric ulcer is erosion of the = left gastric artery
- Perforation of a duodenal ulcer on the anterior wall would most likely enter the = Right posterior subphrenic space
  - It is also asked as
    - When a duodenal ulcer perforates the anterior wall of the duodenum, in the peritoneal cavity the duodenal contents would enter: = the right posterior subphrenic space.
    - Anterior duodenal perforation will cause the contents to move into= Right posterior sub phrenic space

PAIN

- Peptic ulcer pain referred to= Epigastric
- Pain of gastric ulcer is commonly referred to = Epigastrium
- Pt with peptic ulcer has epigastric pain, referred visceral pain is mediated by? = Greater splanchnic nerve
  - It also comes as
    - Pain from duodenal ulcer is carried by= Greater splanchnic nerve
    - Pain sensation from peptic ulcer by= Greater splanchnic
- A middle-aged woman presented with pain in epigastrium. The physician diagnosed it as a case of gastric ulcer. The nerve most likely to be mediating this referred visceral pain is=Greater splanchnic
  - It also comes as

- Pt with peptic ulcer has epigastric pain, the referred visceral pain is mediated by=Greater splanchnic nerve
- Pain sensations origination from the peritoneal irritation by the gastric contents in the lesser sac is carried by= Greater splanchnic nerve

OTHER

- ❖ Zollinger-Ellison syndrome is consistent with? = Peptic ulcer disease
- ❖ An alcoholic hypothyroid patient presented with epigastric pain, nausea, vomiting and numbness. O/E pt is anaemic. Biopsy of stomach shows atrophic gastritis. What shall be the treatment plan= Alcohol abstinence
- ❖ In a duodenal peptic ulcer, the lymph node involved in inflammation is= Celiac
- ❖ An old diabetic pt develop sensory abnormalities of the left foot and ulcer of big toe. The pathogenesis is best described by=Angiopathy and neuropathy

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96. WHICH OF THE FOLLOWING CAUSES CHRONIC ATROPHIC GASTRITIS AND DUODENAL ULCER = H. PYLORI

KNOW THIS ABOUT H. PYLORI

- ❖ Gram negative rod
- ❖ Produces ureases, Increased permeability of the gastric mucosa to hydrogen ion, resulting in back diffusion of hydrogen ion with injury to the gastric mucosa
- ❖ Colonizes mainly antrum of stomach; causes gastritis and peptic ulcers (especially duodenal). Risk factor for peptic ulcer disease, gastric adenocarcinoma, and MALT lymphoma.
- ❖ Tests:
  - o Serology (H. pylori antibodies test) -----Cheapest test but cannot confirm eradication as antibodies stay detectable for up to 18 months.
  - o Urea breath test: --- Most accurate non-invasive test; however, PPIs can cause false negatives, so they should be stopped 14 days before the test.
  - o Fecal antigen test: ----Highly sensitive and specific; can confirm eradication with 95% accuracy, making it suitable for follow-up.
  - o Endoscopic biopsy: --- Gold standard for diagnosing peptic ulcers.
  - o Rapid urease test---- Provides quick results but may give false negatives if PPIs or antibiotics are being used.
  - o Microbiological culture----Helps identify the best antibiotics for resistant infections.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ Patient with peptic and duodenal ulcer which can most likely transform into carcinoma by which of the organism is = H. pylori
  - o It also comes as
    - Which of the following is caused by H. pylori? = Gastric carcinoma
    - One of the following bacteria may promote malignant changes in the gastrointestinal tract = Helicobacter pylori
    - One of the following malignancies is most frequently associated with Helicobacter pylori infection = Gastric carcinoma
    - The carcinogenic bacteria is = H. pylori
- ❖ A Man having pain epigastrium for 5 years is taking NSAIDs for it. He is diagnosed gastric lymphoma. What causes this complication = H. pylori
  - o It also comes as
    - Gastric lymphoma is most commonly associated with = Helicobacter pylori gastritis
    - A 55-year male with past history of epigastric pain for which he was taking antacids was diagnosed as gastric lymphoma. What is the most likely cause = H. pylori

- Organism causing gastritis and ulcers of stomach and duodenum = H. pylori
- Most probable cause of gastric upset and biopsy showing lymphocytes, neutrophils, and plasma cells = H. pylori
- Best non-invasive test to confirm eradication of H. pylori after treatment = Urea breath test
- A 30-year man with vague abdominal pain for 3 years and trouble with acidity for which he was taking antacids, but pain is not relieved. O/E no mass, no ulcer, no difficulty in food intake. Endoscopy of stomach antrum was done which showed lymphocytic erythematous infiltrates & non-atrophic gastritis. The likely cause in him is = H. pylori
- A 45-year-old man has had vague abdominal pain and nausea for the past 3 years. This pain is unrelieved by antacid. He has no difficulty in swallowing and no heartburn following meals. On physical examination, there are no abnormal findings. Upper GI endoscopy reveals antral mucosal erythema, but no ulcerations or masses. Biopsies are taken, and microscopically there is chronic non-specific gastritis. Which of the following conditions is most likely to be present in this man? = Helicobacter pylori infection
- The organism most likely associated with chronic gastritis and chronic gastric and duodenal ulcers is: = Helicobacter pylori
- Which of the following is caused by H. pylori=B- cell Lymphoma

97. WHICH PART OF THE SMALL INTESTINE CONTAINS NA BILE ACID COTRANSPORTER, WHICH RECIRCULATES BILE ACID TO THE LIVER? = TERMINAL ILEUM

KNOW THIS ABOUT BILE

- Composition: Bile salts (bile acids + glycine/taurine), phospholipids, cholesterol, bilirubin; emulsifies lipids.
- Formation: Made by hepatocytes, stored in gallbladder. Cholesterol → primary bile acids → secondary bile acids (gut bacteria) → bile salts (glycine/taurine).
- Release: Triggered by CCK (response to fatty acids/peptides); gallbladder contracts, sphincter of Oddi relaxes.
- Re-circulation: Absorbed in ileum; loss (e.g., ileal resection) causes fat malabsorption and steatorrhea

NOW LET'S DISCUSS SOME PAPER MCQ'S

- The excess bowel movements in a patient with resection of the entire ileum and lower part of the jejunum are due to = Inadequate amounts of bile salt reaching the colon
- Digestion of fats is done by the help of = phospholipids, bile salts, and lipase.
- The quadrate lobe of the liver = Drains bile into the left hepatic duct
- Resection of more than 100 cm of the terminal ileum would result in = Decreased absorption of bile salts
- The biochemical role of bile salts is to: = Facilitate the absorption of lipids
- Deficiency of bile salts causes = Decreased micelle formation in intestines
- Fat digestion is done by? = Emulsification, Bile salt, HCO3, and Lipase
- The form in which bile acids are primarily found in bile = Conjugated to glycine and taurine
- Gallstone blockage of the bile duct leads to = Increase fat content of stool.

98. BILE SALTS ARE REABSORBED FROM THE = ILEUM

REMEMBER

NaCl	❖ In small intestine and colon
K+	❖ Absorbed in small intestine ❖ Actively Secreted in colon
H_2O	❖ 80% in small intestine ❖ 10% in large intestine ❖ 10% excreted in faeces.

Fat soluble vitamins (A, D, E, K)	❖ Absorbed with lipids in small intestine
Folate	❖ Absorbed in small intestine
Calcium	❖ Absorbed in small intestine
Iron	❖ Absorbed as Fe^{2+} in duodenum
Vitamin B_{12}	❖ Absorbed in terminal ileum, requires intrinsic factor that is present in stomach
Bile salts	❖ Absorbed in ileum

NOW LET'S DISCUSS SOME PAPER MCQ'S

Vitamins and Nutrient Absorption:

- Which vitamin is produced in intestinal bacteria and absorbed in blood? = Vitamin K
    - It also comes as
        - The vitamin synthesized by intestinal bacteria and absorbed in significant quantities is = Vitamin K
        - The patient with obstructive jaundice may develop a bleeding tendency because = Vitamin K is not absorbed from the gut
- The substance absorbed mainly in the ileum is = Vitamin B12
    - It also comes as
        - Vit B12 is absorbed in = ileum (terminal ileum)
- A female undergone gastrectomy was given parenteral Vit B12. The inability to absorb vit B12 occurs due to loss of which cells during gastrectomy = Parietal cells
    - It is also asked as
        - The inability to absorb vitamin B12 after gastrectomy is due to loss of = Parietal cells

Iron Absorption:

- Iron absorbed from which part= Proximal duodenum
- Most likely regarding iron absorption=Absorbed in ferrous form
    - It is also asked as
        - Iron absorption from the intestine is increased by= Ferrous form
        - True statement regarding iron absorption is= Absorbed in ferrous form
- Iron absorption best increase with= With citrus fruits
    - Know this
        - Vit C increases iron absorption
        - Calcium decreases iron absorption
- Regarding iron transport in form of =Transferrin
    - It is also asked as
        - Iron binds in its ferrous form with= transferrin
- Most likely about iron absorption= Heme is readily absorbed (Dietary iron is mostly in ferric form which is least absorbable. Heme contains ferrous form and readily absorbed)
    - It also comes as with different options
        - A 43-year male has microcytic anemia, low serum ferritin level, plasma high total iron binding capacity. What would be the most likely pattern of Intestinal iron absorption in him= Dietary iron will be readily absorbed (Dietary iron is In two forms—heme and no-heme----. Heme contains ferrous form and readily absorbed than non-heme---so remember if there is an option of "heme is readily absorbed" like in previous papers---choose that option)

About Na:

- Na actively absorbed from= Colon

- Max active transport of sodium in= Colon
  - Remember Na is actively absorbed from both colon and jejunum
  - But Active transport of sodium is more in colon than in jejunum (Colon > Jejunum)

JEJUNUM:

- Water mostly absorbed from= Jejunum
- Dietary fat is absorbed chiefly in the=Jejunum

KNOWN THE DIFFERENCE:

- Max absorption of fluid occurs in jejunum
- Max water loss of fluid occurs through= colon
- Max water loss and electrolytes occurs through = colon
- Patient underwent abdominal surgery, after which he repeatedly required fluid resuscitation due to wate and electrolyte loss. Which part of his gut had been removed leading to this condition=Ileum
  - Jejunum when removed will be compensated by terminal ileum-- however ileum resection leads to fluid loss as colon not able to absorb sufficiently.
- A patient with fluid loss, now shows metabolic acidosis with hypokalemia. Most fluid loss will be through= Colon

OTHERS

- Sublingual nitroglycerin is absorbed readily into = Sublingual vein
- The drug absorbed through the process of aqueous diffusion following oral administration = Ephedrine
- Which of the following substances must be further digested before it can be absorbed by specific carriers in the intestinal cells=Sucrose
- Fat derived from nutrition is absorbed from the intestine by preparation into=Mixed Micelles
- Resection of ileum and some part of jejunum cause 10 to 20 bowel movements per day cause is= Osmotic plus secretory diarrhea
  - Explanation: Decreased ileal reabsorption of bile salts results in fat malabsorption and steatorrhea. The presentation of increased amounts of bile salts and fatty acids to the colon decreases water absorption and stimulates active chloride and water secretion, producing a cholera-like high-volume **secretory diarrhea**. The loss of the ileocecal valve and ileum segment accelerates intestinal transit time, which does not allow for complete digestion and absorption of food. Water and electrolytes remain associated with undigested food particles and may overwhelm the absorptive capacity of the colon, resulting in an **osmotic diarrhea**

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99. 24 YR. MALE PRESENTED WITH VOMITING. THERE IS HISTORY OF DYSPHAGIA FOR LAST TEN YEARS INITIALLY FOR SOLIDS THEN FOR LIQUIDS. HE LOST 30 KG IN LAST 3 YRS. WHAT IS THE INVESTIGATION REQUIRED=ENDOSCOPY

REMEMBER

Plummer-Vinson Syndrome	- Triad of ("**P**lumbers" **DIE**). - **D**ysphagia, **I**ron deficiency anemia, and **E**sophageal webs.
GERD	- Reflux of gastric contents into lower esophagus because of incompetent lower esophageal sphincter (↓ LES tone) - 24-hour pH monitoring—most accurate investigation - Endoscopy—investigation of choice

Achalasia	- Motility disorder with 3 abnormalities:
	  - Failure of relaxation of LES (↑LES tone) due to loss of ganglion cells in Myenteric (Auerbach) plexus
	  - High LES resting pressure
	  - Aperistalsis
	- Which leads progressive dysphagia to solids and liquids (while in obstruction—

solids only—then may progress to liquid dysphagia as well).

- Investigation:
  - Barium studies----------------esophagus terminates in narrowing at LES ("bird's beak appearance")
  - Manometry----------------Definitive diagnosis

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Pre-malignancy factor leading to Plummer Vinson syndrome? = Iron
- Plummer-Vinson syndrome is associated with= Iron deficiency anemia
- A patient has hemoglobin 6.0. Blood picture shows target cells and microcytic hypochromic anemia. Patient has fever and dysphagia= iron deficiency anemia
  - It also comes as
    - A 26-year-old male presented with weakness and dysphagia. His blood test shows Hb = 6.0g%, MCV = 68fl, MCH = 24pg and target cells. The most likely condition is= Iron deficiency anaemia

GERD

- Obese male with GERD symptoms which is relieved by bed elevation, frothy liquid drooling out of his mouth. Treatment plan should be = Decrease fat in diet
- Patient with GERD, has lower esophageal sphincter function loss. What will you advise him = Decrease fatty meal intake
- A lady is on esomeprazole for GERD. She has nodules on her fingers, distal and proximal joints stiffness and decrease spacing, etc. (scenario of osteoarthritis). The most suitable treatment prescribed will be? = Acetaminophen 1000mg thrice daily
- Most sensitive test for GERD diagnosis = 24-hour pH monitoring.

ACHALASIA

- Patient with dysphagia, severe chest pain, difficult belching and air fluid level. = Achalasia
  - It is also asked as
    - A female came to ER with complains of chest pain, dysphagia, vomiting and difficulty in belching. ECG normal and CXR shows air fluid level in esophagus. What is the likely diagnosis= Esophageal Achalasia
- A 40-year-old male has achalasia of the esophagus. The most likely cause is = Myenteric plexus is deficient in the lower esophagus
  - It also comes as
    - In achalasia of the esophagus: = Myenteric plexus is deficient in the lower esophagus
- In achalasia cardia = There is a deficiency of ganglion cells of the vagus nerve
- The Gut-Brain stimulation for Myenteric plexus through which hormone= Acetylcholine
- If a food bolus gets stuck in the middle third 3rd of esophagus during swallowing, by which mechanism will it be pushed down to the stomach= Secondary peristalsis caused by myenteric plexus
- Secondary esophageal peristalsis: = Is initiated by distention of the esophagus
- A child with difficulty swallowing followed by vomiting of putrid food. On barium meal, dilation of esophagus and narrowing end noted. Diagnosis = Achalasia
  - It is also asked as
    - A boy came to ER with dull chest pain, dysphagia, vomiting, and difficulty in belching. Barium swallow shows esophageal enlargement and ECG normal. Diagnosis = Esophageal Achalasia

SOME TRICKY MCQ'S OF DYSPHAGIA

- Dysphagia to liquids only is due to= Neuromuscular incoordination
  - It is also asked as

- A female presented with dysphagia to liquids for the last 6 months. Laryngoscopy shows normal history of the tract. The most likely cause is =Loss of Neuromuscular coordination
- A 40-year-old female presented with Dysphagia especially to liquids barium enema and gastroscopy are negative of any finding. Which of the following is most likely the cause of dysphagia in this case= Neuromuscular disruption

- Female has HTN presented with Dysphagia. Ptosis meiosis anhydrosis and enophthalmos. Which artery is blocked= Posterior inferior cerebellar artery
- A 58-year-old man has had increasing difficulty in swallowing and has lost weight. Upper GI endoscopy reveals a nearly circumferential mass with overlying ulceration in the mid esophageal region. Biopsy of the mass reveals pink polygonal cells with marked hyperchromatism and pleomorphism. Which of the following is the most likely risk factor for development of his disease= Chronic alcoholism
- A 48-year-old man had a brain stem stroke following a vertebral artery dissection due to a sports-related injury. This patient developed dysphagia. Which of the following structures is involved= Nucleus ambiguous
- A patient with bilateral diplopia, ptosis, and difficulty during chewing. Diagnosis? = Myasthenia gravis

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100. PATIENT HAD LONG STANDING GERD. ENDOSCOPY SHOWED ESOPHAGITIS AND BIOPSY SHOWED GOBLET CELLS AND COLUMNAR CELLS. DIAGNOSIS IS= BARRET ESOPHAGUS

ABOUT BARRETT'S ESOPHAGUS

- Pre-malignant condition in which the squamous epithelium of the esophagus is replaced by metaplastic columnar epithelium containing goblet and columnar cells (specialized intestinal metaplasia)
- It presents as a complication of long- standing GERD (10% cases)
- Diagnosis: ----Endoscopic biopsy
- Complications: Ulceration with stricture formation (most common), Increased risk of esophageal adenocarcinoma.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- The characteristic feature of the squamocolumnar junction 2cm above LES is= Barret's
    - It is also asked as
        - Squamocolumnar epithelium present 3cm above of cardiac end of esophagus. Diagnosis=Barret esophagus
        - Patient had a history of long-standing GERD. Endoscopy showed esophagitis and biopsy revealed goblet cells and columnar cells in the lower esophagus. Diagnosis = Barrett esophagus
        - A person complaining of sharp gastric pain for 2 weeks. Work-up revealed epithelial change in the lower esophagus, i.e., presence of columnar and goblet cells. Such changes suggest= Barrett esophagus
        - Due to long-standing GERD, change in lower 1/3rd of esophagus. This is likely = Columnar hyperplasia
- Adeno carcinoma of esophagus develops in=Barrett esophagus
    - It also comes as
        - The most common premalignant condition of esophageal cancer is = Barrett esophagus
        - A lesion that can predispose to malignancy is = Barrett's esophagus
        - Barrett's esophagus increases the risk of developing= Adenocarcinoma
- Barret's esophagus is an example of= Metaplasia
- Barrett's esophagus is diagnosed by = Columnar metaplasia

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101. PATIENT PRESENTED WITH RAPID DEVELOPMENT OF DYSPHAGIA TO SOLIDS AND HAD HISTORY OF WEIGHT LOSS ALSO HER HEMATOCRIT WAS 30%, DIAGNOSIS= ESOPHAGEAL CARCINOMA

ABOUT ESOPHAGEAL CARCINOMA

- Typically presents with progressive Dysphagia (first solids, then liquids) and weight loss; poor prognosis.
- Squamous Cell Carcinoma:
    - Location: Upper 2/3rd of the esophagus.
    - Risk Factors:
        - Achalasia, Alcohol consumption, Hot liquids, Cigarette smoking.
- Adenocarcinoma:
    - Location: lower 1/3rd of the esophagus.
    - Risk Factors:
        - Barrett esophagus, Obesity, GERD (gastroesophageal reflux disease), Cigarette smoking.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Upper 2/3rd of esophagus carcinoma= Squamous cell carcinoma
- A chronic smoker and alcoholic male with mass in upper two-third of esophagus. Diagnosis= Squamous cell carcinoma
    - It is also asked as
        - A mass in the bronchus of a chronic smoker was found. The probable cause is? = Squamous cell carcinoma
        - Diagnosis in an alcoholic smoker with mid-esophagus dysphagia for solids first, then liquids = Squamous cell carcinoma of esophagus
- Most common site for squamous cell carcinoma esophagus is= Middle third
- A pt. known smoker 40 packs/year presents with increasing retrosternal pain and progressive dysphagia, weight loss, cervical lymph nodes enlarged, Chest is clear. What is the most likely dx= Esophageal carcinoma
- A 65-year-old smoker with significant weight loss presents with dysphagia to solid. Mechanism of dysphagia is= Decrease peristalsis
- Progressive dysphagia only to solid food is characteristic of which of the following = Esophageal carcinoma
- A patient known smoker 40 packs/year presents with increasing retrosternal pain, progressive dysphagia, weight loss, and cervical lymph nodes enlarged. Chest is clear. Diagnosis? = Esophageal carcinoma
- Adenocarcinoma of esophagus develops in= Barrett esophagus
- In a patient diagnosed with adenocarcinoma of the stomach during an endoscopy, which of the following precursor lesions is most likely to be present= Intestinal metaplasia
- Specific dietary carcinogen for esophageal carcinoma is = Nitrosamine

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102. A PATIENT PRESENTS WITH KERATITIS, PAINFUL JOINTS, AND XEROSTOMIA. THE MOST LIKELY DIAGNOSIS WOULD BE: = SJOGREN SYNDROME

ABOUT SJOGREN SYNDROME

- Autoimmune disorder.
- Characteristics includes
    - Keratoconjunctivitis sicca (dry eyes), Xerostomia (dry mouth)
    - Associated connective tissue disease, most often Rheumatoid arthritis.
- Sjögren syndrome Is associated with an increased incidence of malignant lymphoma

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- The most evident clinical feature of Sjogren syndrome is? = Dryness of eyes and dryness of mouth
- Sjogren's syndrome is most commonly associated with: = Rheumatoid arthritis
- A female complains of pain and dryness of eyes, dry mouth and parotid swelling, dysphagia. CXR shows fibrosis of lungs. Diagnosis= Sjogren syndrome

- ❖ A 55-year female presents with 4 months' history of blurring of vision and itching on both the eyes. She also complains of dysphagia and dryness of mouth. O/E she has B/L parotid swelling and fibroid mouth fissures. CXR shows pneumonitis. The most likely diagnosis is = Sjogren syndrome
    - o Also remember
        - ▪ Dysphagia occurs in= scleroderma
- ❖ A lady with dysphagia, and complain that she is not able to type on keyboard, but no other joint problems noted, also she has lost her wrinkles over face which had developed due to aging: = CREST Syndrome

103. MUCUS ACINI ARE PRESENT IN= SUBLINGUAL GLAND

NOTE:

- Submandibular gland is mixed i.e both serous and mucinous.
- Parotid is pure serous and
- Sublingual is pure mucinous.
    - o Ref: jinquira histology

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- ❖ Histological slide of salivary gland showing mucus acini with serous demilunes = Submandibular gland
    - o It also comes as
        - ▪ A slide kept for histology which shows abundant mucinous glands with few serous glands and also few ducts were seen. The gland is most like = Submandibular
        - ▪ A microscopic section of a gland shows a large number of serous acini with some mucous acini capped by serous demilunes. A number of intralobular and interlobular ducts in connective tissue stroma can also be seen. This microscopic picture describes which gland? = Submandibular gland
- ❖ Correct statement regarding parotid gland = Pure serous acini
    - o It is also asked as
        - ▪ A microscopic section of a gland shows a large number of serous acini and a number of intralobular striated ducts in connective tissue stroma. The gland having this microscopic appearance is? = Parotid gland
- ❖ Serous cells are = The nuclei are pushed to base
- ❖ The component of salivary secretion containing numerous oligosaccharide components which serve as attachment sites for microorganisms is = Mucin

104. 16 YRS. OLD BOY CAME WITH DIARRHEA. BIOPSY SHOWED VILLOUS ATROPHY. NO IMPROVEMENT IN SYMPTOMS ON GIVING GLUTEN FREE DIET. DIAGNOSIS= GIARDIASIS

Remember

Celiac Disease (aka as sprue, gluten sensitive enteropathy)	❖ Also known as gluten sensitive enteropathy ❖ Associated with: o Type I diabetes mellitius, Dermatitis herpetiformis, ↓Bone density ❖ Lab findings: o Anti-endomysial, anti-tissue transglutaminase, and anti-gliadin antibodies o **Duodenal biopsy** (gold standard) which shows ❖ Blunting of villi, Lymphocytes in lamina propria, Crypt hyperplasia

Whipple Disease	(Mnemonic: FOAMY WHipped cream PASsed in a CAN) ❖ Characterized by infiltration of small intestinal mucosa by FOAMY macrophages (Tropheryma WHIPplei) that stain positive with PAS reagent Infection ❖ Cardiac symptoms, Arthralgias, and Neurologic symptoms are common ❖ Diagnosis: ✓ **Jejunal biopsy**—shows macrophages containing PAS ✓ Diagnosis made by Tissue PCR ❖ Management: ✓ IV penicillin plus streptomycin 2 weeks then ✓ oral co-trimoxazole or tetracycline for a year (have the lowest relapse rate)
Giardiasis	❖ Caused by Giardia lamblia---Bloating, flatulence, foul-smelling, fatty diarrhea
Amebiasis	❖ Caused by Entamoeba histolytica ❖ Bloody diarrhea (dysentery), liver abscess, histology shows, flask-shaped ulcer

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Celiac disease gold standard test = Duodenal biopsy
- A young man with chronic small bowel diarrhea, duodenal biopsy shows IgA anti-human tissue transglutaminase (TTG), and IgA anti-endomysial antibodies. What is the likely diagnosis = Celiac
- A patient with prolonged diarrhea undergoes OGD. Biopsy of small intestine shows numerous crescent-shaped protozoa adjacent to epithelial brush border. Which is the likely pathogen involved = Giardia lamblia
  - It also comes as
    - Mother brings her child complaining of diarrhea and weight loss. Biopsy shows two-nuclei organism which is pear-shaped. Diagnosis = Giardiasis
- A child developed diarrhea. Biopsy of intestine shows villous atrophy and gluten-free diet doesn't improve his symptoms. What is the probable diagnosis = Giardiasis
  - It also comes as
    - A 16-year-old boy presented with diarrhea. Small intestinal biopsy of the patient showed villous atrophy. There was no improvement of symptoms with a gluten-free diet. The most likely diagnosis in this case would be = Giardiasis
- Regarding parasitic disease, the immunological diagnosis is LEAST likely helpful in = Giardiasis
- In Whipple disease some additional info is often given in the form of = PAS positive
  - It is also asked as
    - A 12-year-old boy presented with diarrhea not responding to routine antidiarrheal treatment. Jejunal biopsy showed partial villous atrophy with many PAS positive macrophages. Most likely diagnosis would be = Whipple's disease
- 1-year child brought by mother with complains of diarrhea and flatulence on/off after taking milk/ milk products. The other was advised to stop giving any/all milk products for symptoms resolution What is the likely diagnosis= Lactose intolerance
- Amoeba commonly resides in= Cecum
- What is the characteristic feature of Entamoeba histolytica= Ingestion of RBCs in cytoplasm
- For diagnosis of amoeba, rectal biopsy was done. Which of the following will confirm the diagnosis = PAS (Periodic Acid-Schiff)
  - Note that Trophozoites are usually intensely PAS positive. Stains the glycogen and carbohydrate-rich walls of the amoebae, making them visible under the microscope.

105. WHICH STRUCTURE IS FOUND 2 FEET PROXIMAL TO APPENDIX AT THE ANTIMESENTERIC BORDER OF INTESTINE=MECKEL'S DIVERTICULUM

NOTE:

- Meckel diverticulum

  - o Persistence of the vitelline duct.
  - The rule of 2's: 2 times as likely in males, 2 inches long, 2 feet from the ileocecal valve, commonly presents in first 2 years of life, may have 2 types of epithelia (gastric/ pancreatic).
- ❖ Diverticulum:
  - o Blind pouch protruding from the alimentary tract that communicates with the lumen of the gut.
- ❖ Diverticulitis
  - o Inflammation of diverticula classically causing LQ pain, fever, leukocytosis.
  - o Sometimes called "left-sided appendicitis" due to overlapping clinical presentation.
- ❖ Diverticulosis:
  - o Many false diverticula of the colon commonly sigmoid.
  - o Caused by inc intraluminal pressure and focal weakness in colonic wall

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- ❖ Which structure is found 2 feet proximal to appendix at the antimesenteric border of intestine= Meckel's diverticulum
  - o It also comes as
    - ▪ A tubular elongation at the anti-mesenteric border two feet away from the appendix was noted. The most likely cause of this abnormality is: = Meckel's diverticulum
    - ▪ One of the following is NOT a feature of Meckel's diverticulum = Arises from mesenteric border of ileum (it arises from antimesenteric border)
- ❖ A patient was admitted to the surgical department with suspected inflammation of Meckel's diverticulum. What part of bowels should be examined in order to discover the diverticulum in course of an operation= Ileum
  - o It also comes as
    - ▪ Meckel's diverticulum examination should focus on the = ileum
    - ▪ Meckel's diverticulum, which bowel should be examined= Ileum
- ❖ Meckel's diverticulum at times contains = Acid-secreting mucosa
- ❖ A Child having Meckel's diverticulum presents with bleeding per rectum. This is most likely due to= Ectopic gastric tissue
- ❖ Remnant of Vitello intestinal duct may result in formation of=Meckel diverticulum
  - o It is also asked as
    - ▪ The vitelline duct most likely forms? = Meckel's diverticulum
- ❖ Patient have abdominal pain. On sigmoidoscopy there is obstruction in upper part of sigmoid colon with ulcer. Patient have appendectomy scar that was done few year back. Cause of this is= Diverticulosis
  - o It is also asked as
    - ▪ A patient with obstruction in the upper part of the sigmoid colon with an appendectomy scar likely has = Diverticulosis
- ❖ Diagnosis for a patient with dysphagia, regurgitation, and foul breath with lung crepitation? = Zenker's diverticulum
  - o It also comes as
    - ▪ A 30 yr old mail presents with complaints of dysphagia with regurgitation and foul breath. O/E pallor is present along with bilateral lung crepitation. The most likely diagnosis is= Zenker's diverticulum
- ❖ Segmental appearance of an intestinal pouch is due to=Haustra
- ❖ An 8-month-old infant present with alternating episodes of obstruction and passage of diarrheal stools. Radiological finding show dilated bowel segments. Colonic biopsy finding reveal absence of ganglion cell in the distended bowel segment. It is a case of= Hirschsprung's disease

106. CRYPT ABSCESS IS A HISTOPATHOLOGICAL FEATURE COMMONLY ASSOCIATED WITH WHICH OF THE FOLLOWING DISEASES? ULCERATIVE COLITIS

About Inflammatory Bowel Disease

	Ulcerative Colitis	Crohn's disease
Definition	❖ Chronic inflammation of the colon (mucosa and submucosa).	❖ Chronic inflammation of the entire GI tract (mouth to anus, rectum usually spared).
Features	❖ Continuous lesions, crypt abscesses, Psuedopolyps, no granulomas	❖ Skip lesions, cobblestone appearance, transmural inflammation, non-caseating granulomas
Extra intestinal manifestation and Complications	Mnemonic: **U-PAST-Colitis** ❖ **U**veitis ❖ **P**yoderma gangrenosum ❖ **A**rthritis (most common overall) **A**nkylosing spondylitis ❖ Primary **S**clerosing cholangitis ❖ **T**oxic megacolon ❖ **C**olon carcinoma	Mnemonic: **PIE SAC** ❖ **P**erianal disease ----Anal fissure, anal **fistulas** ❖ **E**rythema nodosum ❖ **S**trictures ❖ **A**phthous ulcers, **Arthritis** (most common overall) ❖ **C**alcium oxalate stones ----renal stones
Radiography	❖ Lead pipe appearance	❖ String sign
Investigation	❖ Serological testing ❖ Antineutrophil cytoplasmic antibody (ANCA) –Positive in UC ❖ Colonoscopy with biopsies confirms the diagnosis	❖ Serological testing ❖ Anti-Saccharomyces cerevisiae antibody (ASCA- -- Positive in CD ❖ Colonoscopy with biopsies confirms the diagnosis

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- ❖ A patient undergoes surgery for Crohn's disease. The surgery involves resection of about 100cm of the terminal ileum with sparing of the colon. The patient suffers the complications of short bowel syndrome and nephrolithiasis. A urine test is likely to reveal = High Oxalate
    - o In extensive Crohn's disease, especially with small bowel involvement or after bowel surgery, fat malabsorption occurs. This binds calcium in the gut, leaving oxalate unbound, which is absorbed in excess, leading to hyperoxaluria and an increased risk of kidney stones.
- ❖ In Crohn's disease, which type of renal stones are formed? Oxalate stones
    - o It also comes as
        - ▪ Regarding extensive Crohns disease, which is true= Hyperoxaluria
        - ▪ Ileal resection in Crohn's disease resulting in Oxalate stone formation. The most probable cause is = Inc oxalate absorption from gut
        - ▪ A patient comes with complaints of diarrhea and weight loss. Routine labs were done along with USG abdomen, which showed renal stones. Most likely diagnosis is= Crohn's disease
- ❖ One of the following features which favors the diagnosis of Crohn's disease rather than ulcerative colitis is = Perianal lesions
    - o It is also asked as
        - ▪ Crohn's disease different than ulcerative colitis in? = Perianal lesion
        - ▪ Which one of the following features is in favor of ulcerative colitis rather than Crohn's disease= Rectal involvement
- ❖ Which of the following is a characteristic feature of Crohn's disease=Transmural inflammation
- ❖ Which of the following is more characteristic of Crohn's disease when compared to ulcerative colitis= Granulomas
- ❖ 40 years old male with ulcerative colitis, now there is exacerbation of GI symptoms, severity of the disease can be assessed by=Ankylosing spondylitis
    - o It is also asked as
        - ▪ Which one of the following is a complication of ulcerative colitis in active disease= Ankylosing spondylitis

  - Inflammatory bowel disease is associated with= Ankylosing spondylitis
- ❖ Primary sclerosing cholangitis is most associated with= Ulcerative colitis
- ❖ Most serious medical emergency in ulcerative colitis is= Toxic megacolon
- ❖ The most common dermatological complication of inflammatory bowel disease is= Erythema nodosum
- ❖ A 29-year-old male complains of diarrhea and weight loss for 3 months. On examination, there is a palpable mass in the iliac fossa. What is the diagnosis= Crohn's disease
  - o It is also asked as
    - A middle-aged lady with a history of loose motion for months, associated with pain in the abdomen and weight loss. On examination, she has a soft mass of small consistency in the right iliac fossa. Most appropriate diagnosis is= Crohn's disease
    - Patient complaining of chronic diarrhea with on and off symptoms, on examination a mass is palpable in the right iliac fossa. His TLC count is normal. What could be the underlying diagnosis= Crohn's disease
- ❖ Comb sign in CT abdomen is seen in= Crohn's disease

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107. MILD ULCERATIVE COLITIS, DOC= SULFASALAZINE

REMEMBER:

- ❖ Acute flares = Corticosteroids.
- ❖ Maintenance of remission (mild disease) = Sulfasalazine or 5-ASA (mesalazine).
- ❖ Maintenance of remission (moderate to severe disease) = Azathioprine or other immunomodulators/biologics.
- ❖ Fistulas, abscesses, or perianal ulcers= Metronidazole

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- ❖ A 21-year boy presents with acute ulcerative colitis. The treatment of choice should be= IV Corticosteroids
- ❖ A known CKD patient diagnosed with Crohns is started on corticosteroids for induction. Which drug is best for disease remission=Azathioprine
- ❖ A patient with Crohn's disease has painful perianal ulcers. On examination, numerous shallow ulcers. First-line treatment= Oral metronidazole
- ❖ Side effects of mesalazine are all except= Infertility
- ❖ Side effects of sulfasalazine are all except= Hypothermia
- ❖ Treatment of choice for ulcerative colitis involving rectum and sigmoid colon is= Topical mesalazine

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108. HEPATITIS SCENARIO, VIRAL MARKERS NEGATIVE, ALT SLIGHTLY RAISED, ON EXAMINATION THERE WERE SOME EYE FINDINGS. WHAT IS THE SUITABLE DIAGNOSTIC TEST? = SERUM CERULOPLASMIN.

REMEMBER IN WILSON DISEASE

- ✓ Normally: copper is absorbed in small intestine, taken into liver, where it is stored and incorporated into ceruloplasmin.
- ✓ In Wilson's disease: copper incorporation into ceruloplasmin and its excretion into bile are impaired resulting in copper accumulation in liver
- ✓ Clinical manifestations:
  - o Liver→ hepatitis, fulminant hepatic failure, Micronodular cirrhosis.
  - o Eyes→ Kayser-Fischer rings (greenish-brown discoloration of cornea)
  - o CNS→ tremors, parkinsonism
- ✓ Diagnosis:
  - o Decreased serum ceruloplasmin, ↑ urinary excretion of copper, liver biopsy

NOW LET'S DISCUSS SOME PAST PAPERS MCQ'S

- In Wilson's disease= Increased copper
- Wilson disease diagnostic feature= Keisha Fischer ring in the eye
    - It also comes as
        - What other finding will be noted in a young man with hepatosplenomegaly, deranged LFTs, decreased ceruloplasmin? = Kayser-Fleischer ring
        - Increased hepatic copper and low serum ceruloplasmin are associated with = Kayser-Fleischer ring
- A patient with Kayser-Fleischer rings and hepatolenticular degeneration will have = Increased urinary copper excretion
- A 22-year-old male had mild jaundice. The most useful investigation in this case would be= Ceruloplasmin level
- A patient with progressive writhing and jerking movements of the extremities, excess drooling, and multiple joint pains. MRI showed B/L hypodense basal ganglia. Ocular exam shows Kayser-Fleischer rings hepatolenticular degeneration). Which lab abnormalities will be present= Increased urinary copper excretion
    - It also comes as
        - Hepatolenticular degeneration also known as Wilson disease, is related to= Increase Copper concentration
- A 22-year-old male had mild jaundice. His alanine transaminase was raised slightly. Serological tests for viral hepatitis were negative. Examination of the eyes revealed some abnormality. Immunological tests were not confirmatory. The most useful investigation in this case would be= Ceruloplasmin level
    - It also comes as
        - Wilson's disease can be diagnosed by = Serum ceruloplasmin
        - Which of the following changes occur in Wilsons disease= Dec Ceruloplasmin
        - Wilson's disease can be diagnosed by= Serum ceruloplasmin
- In Wilson disease, the most appropriate and useful investigation would be=Liver Biopsy
    - Note= (best initial test is ceruloplasmin while most accurate and useful is liver biopsy)

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109. ON BIOPSY, YELLOW-BROWN GRANULES IN LIVER CELLS THAT TURN BLUE ON STAINING SUGGEST? = HEMOSIDERIN

SOME PAST PAPER MCQS ABOUT LIVER

LIVER FUNCTION AND DISEASE

- In liver diseases, which enzyme is decreased = Pseudocholinesterases
    - It also comes as
        - The level of one of the following enzymes may fall when liver cells are damaged in case of liver disease: = Pseudocholinesterase
- Most common hemodynamic change in chronic liver disease = Decrease albumin
    - It is also asked as
        - Which of the following serum levels would help in distinguishing acute and chronic liver disease = Albumin
- A 57-year-old male with a history of alcoholism presented with abdominal pain, jaundice, and hyperbilirubinemia. Labs show AST (SGOT) 88 U/L, ALT (SGPT) 121 U/L, Bilirubin Total 6.5 mg/dL. Cause of leakage of these liver enzymes in blood = Due to hepatocyte cell membrane damage
- Liver picture in acetaminophen toxicity = Extensive necrosis
    - It also comes as
        - A girl brought to the ER with a history of ingesting 100 tablets of 500 mg Paracetamol. What would be seen on liver biopsy? = Extensive necrosis
- Major storage of iron in body is = Liver
- The highest regenerative property among body tissues is of = Liver

- Several weeks after partial liver resection, the liver regenerated. The process responsible for this is = Hyperplasia.
- After partial hepatectomy, the liver regenerates in = 1-2 weeks.
  - It is also asked as with different options
    - After partial hepatectomy, liver regeneration takes place in = 6-15 days

LIVER TRANSPLANTATION AND REJECTION

- Cause of death after liver transplantation due to which pathogen = CMV
- Which organ has the least chance of transplant rejection = Liver
- An HLA sampling not compatible yet no rejection. This occurs in = Liver

DRUGS AND CONTRAINDICATIONS

- Which drug is contraindicated in chronic liver disease (CLD) = Pentazocine
- An anesthetic agent that decreases blood flow to the liver = Halothane
- Which drug can be given to a patient preoperatively with liver decompensation = Lorazepam

LIVER-RELATED CONDITIONS

- A 55-year-old male alcoholic presents with symptoms of liver disease and is found to have mildly elevated liver enzymes. A liver biopsy examined with a routine H&E stain reveals abnormal clear spaces in the cytoplasm of most hepatocytes. Material most likely forming these cytoplasmic spaces = Triglyceride
- Removal of some of the carbohydrates bound to serum protein results in = Rapid uptake and destruction by the liver
- Regarding the breakdown of erythrocytes, correct is? = Yields bilirubin which is bound with plasma protein taken to liver

UNIQUE FEATURES OF LIVER

- Arterial thrombosis will not affect which organ = Liver
- Which organ can escape from ischemia = Liver
- Which blood vessel allows the liver to perform detoxification? = Portal vein
- Most drugs are metabolized in = Liver
- Liver is the only organ capable of = Urea formation
- Arterial thrombosis will not affect Which organ= liver
- Which organ has the least chance of transplant rejection= Liver
- The metabolic fuel for the liver in the post-absorptive phase is = Fatty acids

LIVER PATHOLOGY, CANCER AND DAMAGE

- On biopsy, yellow-brown granules in liver cells that turn blue on staining suggest? = Hemosiderin
  - Know the difference
    - Yellow-brown granules in liver cells are suggestive of = Lipofuscin
    - Yellow brown granules were found in liver and Kupffer cell of a man with hereditary hemochromatosis. These granules became blue following Prussian blue reaction. These granules likely are= Hemosiderin
- Major hemostatic changes in liver disease is = Increased PT
- The most common hepatic malignancy is = Metastasis to liver
- Bone metastasis is NOT a feature of = Liver cell carcinoma
- Adenocarcinoma of the colon will metastasize first to = Liver
- A 55-year man with a long history of liver cirrhosis visits his physician with a new complaint. Recently he noticed an abnormal lesion on his abdomen. His physician recognized these lesions as caput medusae. Which veins are most likely involved in this case? = Paraumbilical

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110. **PREGNANT LADY WITH BILE DUCT OBSTRUCTION. DIAGNOSTIC INVESTIGATION = GGT**

UNDERSTAND THE LIVER ENZYMES

- ✓ For Obstructive → Marked elevation of ALP and GGT
    - o If only Pregnant lady mention= ↑ GGT
- ✓ Alcoholic hepatitis= AST> ALT (make a toAST with Alcohol)
- ✓ Viral hepatitis= ALT>AST
- ✓ Mallory bodies with raised hepatic enzymes= Alcoholic hepatitis
- ✓ Differentiate between types of jaundice= GGT
- ✓ Pancreatitis= inc serum amylase

NOW LET'S DISCUSS SOME PAPER MCQ'S

GENERAL LIVER FUNCTION AND JAUNDICE

- ❖ The test used to best monitor Hepatitis B is = SGPT (aka as ALT)
- ❖ The test used to differentiate between the type of jaundice is = Direct bilirubin
- ❖ Cellular change leading to elevated ALT and AST in viral hepatitis = Plasma membrane damage
- ❖ Nutmeg liver occurs in = Chronic passive congestion
- ❖ ALT and AST use which vitamin as a cofactor? = Vit B6
- ❖ Difference between bile from liver and gall bladder is = Bile salts

SGPT (SERUM GLUTAMIC PYRUVIC TRANSAMINASE) OR ALT (ALANINE AMINOTRANSFERASE)

- ❖ The test used to best monitor Hepatitis B is = SGPT (aka as ALT)
- ❖ A child presents with fever, jaundice, decreased appetite, and right hepatic pain. Which investigation should you do next? = Serum bilirubin + ALT
- ❖ Young boy presents with yellow discoloration of sclera, nausea, vomiting, and fatigue. He gives a history of a drug given by a local quack. O/E liver parenchymal injury. Which enzyme is deranged? = ALT
    - o It also comes as
        - ▪ Quack gives some medicine which causes hepatic necrosis. Which of the following will increase? = ALT
        - ▪ A patient was given drugs by a local quack and is now jaundiced. Which enzyme raised due to liver parenchymal injury is = ALT
        - ▪ A 60-year-old male patient developed jaundice after the use of a drug prescribed by a quack. His liver biopsy showed parenchymal necrosis. The serum enzyme most likely to be raised is: = Alanine transaminase

GGT (GAMMA-GLUTAMYL TRANSFERASE)

- ❖ A 35-year pregnant female presents with biliary colic, rash, and cholelithiasis. The enzyme most likely raised will be = GGT
    - o It is also asked as
        - ▪ A pregnant lady presented with jaundice. Ultrasound abdomen was normal. The most useful serum enzyme assay in this patient is = GGT
        - ▪ An obese pregnant lady presents with jaundice. USG shows bile duct obstruction. Diagnostic investigation will be = GGT
        - ▪ A pregnant female presented with jaundice thought to be secondary to biliary stone. The most useful serum enzyme assay in this patient would be = Gamma glutamyl transferase
- ❖ In a patient with chronic hepatitis C and increased ALT and AST levels, what is the most probable cause of the elevated AST and ALT? = Hepatocyte membrane damage
- ❖ Which of the following enzyme will be raised in Biliary obstruction and parenchymal necrosis? = Alkaline phosphatase
- ❖ After gall bladder surgery, an old lady developed obstruction to biliary flow from liver to intestine. She is likely to have raised plasma levels of = Alkaline phosphatase
- ❖ An old woman presented with jaundice and biliary colic, diagnosis of cholelithiasis was made. Synthesis of which of following enzyme is likely to be increased? = Alkaline phosphatase

- Which of the following test is used to differentiate between the types of jaundice? = GGT

ALP (ALKALINE PHOSPHATASE)

- Damage to bile duct which will increase? = Alkaline Phosphatase
- Bile obstruction between liver and bile duct. Which will elevate? = Alkaline Phosphatase
  - It is also asked as
    - After cholecystectomy, biliary obstruction scenario, which one of the following would be markedly increased? = Alkaline phosphatase
    - A male with jaundice due to stone in biliary stone. Most important investigation to do is? = ALP
    - Biliary obstruction and parenchymal necrosis. Which of the following will be increased? = ALP
    - A person comes to OPD and was found to have gallstones leading to bile duct obstruction. Which enzyme will be raised? = Alkaline phosphatase
    - An old woman presented with jaundice and biliary colic. Diagnosis of cholelithiasis was made. Synthesis of which of the following enzyme is likely to be increased? = ALP
    - The plasma concentration of one of the following liver enzymes is increased in patients with biliary obstruction = Alkaline phosphatase
    - Which of the following enzyme will be raised in Biliary obstruction and parenchymal necrosis? = Alkaline phosphatase
    - After gall bladder surgery, an old lady developed obstruction to biliary flow from liver to intestine. She is likely to have raised plasma levels of = Alkaline phosphatase
- 40-year obese female presented with pain in epigastrium, vomiting. Labs show ALP raised. Diagnosis? = Gallstones
- A patient presented with pallor, right hypochondriac pain, and deep jaundice. Bloods show raised conjugated bilirubin, increased ALP, and Hb 7. What is the probable diagnosis? = Pigment stone
  - It is also asked as
    - High serum alkaline phosphatase and decreased hemoglobin suggest jaundice due to = Pigment stone
    - A 20-year-old boy with chronic anemia now presented with Severe Jaundice for 2 weeks. Hb 7 and ALP >1000. Diagnosis is=Pigment stones

MISCELLANEOUS

- Raised ALT, AST of CLD, Mallory bodies in microscope due to? = Alcoholic Hepatitis
- A 41-year-old man is found in an obtunded state, and examination shows he is icteric. His abdomen is enlarged with a fluid thrill. An abdominal CT scan shows extensive intraperitoneal fluid and a uniformly enlarged liver that has decreased attenuation. Laboratory studies show AST of 563 U/L, ALT 501 U/L, and alkaline phosphatase 55 U/L. The most likely diagnosis is = Alcoholic hepatitis
- A 62-year-old man is brought to the emergency room in a disoriented state. Physical examination reveals jaundice, splenomegaly, and ascites. Serum levels of ALT, AST, alkaline phosphatase, and bilirubin are all elevated. A liver biopsy demonstrates alcoholic hepatitis with Mallory bodies. These cytoplasmic structures are composed of interwoven bundles of which of the following proteins? = Intermediate filaments
- Hepatic encephalopathy grade 4 by= Paracetamol
- A man with a history of chronic alcoholism presented with abdominal pain. Serum amylase level is 1600, ALT 75. What is your diagnosis? = Acute pancreatitis
  - It also comes as
    - An adult alcoholic presented with severe abdominal pain radiating to back. His Serum amylase was 1600, ALT 50, AST 40, ALP 200. All other investigations are normal. Diagnosis= Acute pancreatitis
- A 40-years male with jaundice. Liver function tests show direct bilirubin 10, ALP 1000, ALT-75, GGT: 227. What is the most likely diagnosis=Extra hepatic Cholestasis

111. A CHILD PRESENTS WITH JAUNDICE. TOTAL SERUM BILIRUBIN = 10.1MG/DL, DIRECT =9MG/DL, INDIRECT= 1.1MG/DL. WHAT IS THE DX? = DUBIN JOHNSON SYNDROME

KNOW THIS

- Unconjugated Hyperbilirubinemia:
  - Hemolytic Jaundice: ↑ UCB from hemolysis (e.g., sickle cell anemia).
  - Congenital non-hemolytic: ↓ UCB conjugation.
    - Crigler-Najjar I: UDP-glucoronyl transferase absent, kernicterus. Crigler-Najjar II: UDP-glucoronyl transferase decreased, mild jaundice, treat with phenobarbital.
    - Gilbert: Triggered by stress, mild jaundice.
- Conjugated Hyperbilirubinemia:
  - Intra-Hepatic: PBC, autoimmune hepatitis, Dubin-Johnson (black liver), Rotor (no black liver).
  - Extra-Hepatic: Pancreatic cancer, biliary strictures, stones.
- Know this---- Yellow stains in diaper= biliary atresia

NOW LET'S DISCUSS SOME PAPER MCQ'S

- A baby at 6 weeks of age previously healthy, presented first time with jaundice and yellow stain in diaper. All the other labs were normal except it showed hyperbilirubinemia. Diagnosis=Biliary atresia
  - It is also asked as
    - An infant was brought for first review at age of 6 weeks. It is noted that infant is jaundiced and that diaper is stained with bilirubin. The most appropriate diagnosis is = Biliary atresia
- What is the most common cause of neonatal hyperbilirubinemia (neonatal jaundice)? = Physiological
- Patient with pruritus, ALP: 1600, GGT: 250, ALT: 75, direct bilirubin 15. Cause= Extra hepatic cholestasis
- A 21-year-old healthy man presented with intermittent mild jaundice with no bilirubinuria. His liver function tests revealed: Total bilirubin: 42 (3-18 μmol/l), Direct bilirubin: 6 (<8 μmol/l), Albumin: 46 (33-50 g/l), Alanine transaminase: 30 (<3 mIU/l), Alkaline phosphatase: 75 (30-120 mIU/l). The most likely cause is = Gilbert's disease
- A Child presents with jaundice. Total Serum Bilirubin = 10.1mg/dl, Direct = 9mg/dl, Indirect = 1.1mg/dl. What is the diagnosis = Dubin Jonson syndrome
- Crigler Najjar type 2 is associated with deficiency of = UDP glucuronosyltransferase

112. PREGNANT LADY WENT TO A REMOTE AREA DEVELOPED JAUNDICE CAUSE= HEP –E

REMEMBER: HEPATITIS

- ✓ Most Common hepatitis, =HAV
- ✓ Remote area= HEV
- ✓ HDV has the highest mortality rate at 20%
- ✓ Lethal in pregnancy =HEV
  - It doesn't mean that wherever pregnancy would come you would select HEP-E, remember hepatitis A is still most common
- ✓ Spread through Oro-fecal= HAV>HEV
- ✓ Hepatocellular carcinoma = HBV> HCV (in Pakistan Hep C is the most common cause)
- ✓ Hepatitis B-----Associated with Polyarteritis nodosa, Aplastic anemia
- ✓ Hepatitis C ---- Associated with NHL, ITP, autoimmune hemolytic anemia
- ✓ The most common route of infection of H.B.V. and H.C.V. is= Injection with contaminated needles

NOW LET'S DISCUSS SOME PAPER MCQ'S

HEPATITIS A

- About 220 students developed fever, body ache, loss of appetite and yellow discoloration of the eyes. The probable virus causing these symptoms is=Hep A
- A boy ate chickpeas (cholay word recalled by students---may be used by CPSP) from roadside develop hepatitis, which type=Hepatitis A
  - It also comes as
    - Child eaten chickpeas 10 days back after which he develops fever and vomiting that subsided after. Now he presents which jaundice. Cause= Hepatitis A
- Most common cause of hepatitis in pregnancy is=Hep A
  - It also comes as
    - The most likely cause of jaundice and deranged LFTs in pregnancy is = Hepatitis A
- The most frequent etiology of hepatitis in our country is = Hepatitis A virus
- The most frequent etiology of hepatitis in Asia with a minimum complication is = Hepatitis A virus

HEPATITIS B AND D

- Presence of delta antigen (HDV) shows=Chronicity
- Which hepatitis has the highest mortality rate=Hep D
- Hepatitis D is active is in the presence of=Hep B
- Most common hepatitis transmitted through sexual contact is= Hep B
- Hepatitis which is associated with vasculitis= Hep B
  - It also comes as
    - p- ANCA granulomatosis vasculitis is associated with=Hep B
    - A scenario of viral hepatitis closely related with vasculitis, autoimmune relation and also there was given one autoantibody which hepatitis virus will be that= Hepatitis B virus.
- Which of the following is the best marker for Hep B monitoring=SGPT
  - It is also asked as
    - The test used to best monitor Hepatitis B is=SGPT
    - The most appropriate laboratory investigations for monitoring hepatitis B viral infection is = Serum glutamic pyruvate transaminase

HEPATITIS C

- Patient is Hep C RNA +ve on PCR but has no other complication and is perfectly normal. The next step is to = Interferon + ribavirin
- A male presented with complaints of malaise for 1 year. Labs show HB 10, TLC 6800, platelets 211000, MCV 84. Bone marrow biopsy reveals the morphology of all cells in normal line and maturation. Bone marrow showed increased iron staining. What is the likely diagnosis? = Hep C
- A patient with multiple violaceous nodules on shins and lacy buccal lesions in the mouth. This condition is most likely associated with = HCV (lichen planus associated with Hep-C)
- Inflammation of the portal triads that spills into adjacent lobules, bands of inflammation extending between portal areas and terminal hepatic (central) veins with foci of liver necrosis. Diagnosis = Chronic active hepatitis C
- A person giving blood comes in for investigation. His virology shows Anti-HCV +. Next step in investigation should be = PCR RNA
- Most common cause of liver cirrhosis in adult male is = Hep C
  - It also comes as
    - The most common promoting factor for the development of liver cirrhosis in adult males is= Hepatitis "C" infection
- One of the common predisposing factors for primary hepatocellular carcinoma is= Hepatitis C viral infection
  - It also comes with different options
    - The most commonly known cause of hepatocellular carcinoma in developing countries is = Both hepatitis B and hepatitis C

HEPATITIS E

- Which of the following has Orofecal route of transmission=Hepatitis E (remember HAV>>HEV)
  - It also comes as
    - Fecal-oral route is the most common mode of spread of? = Hepatitis E
    - Which of the following disease is transmitted via fecal-oral route= Hepatitis E
- The epidemic form of hepatitis, which does not lead to chronic liver disease is= Hepatitis E
- Which of the following hepatitis has most lethal effect during pregnancy=Hepatitis E
  - It also comes as
    - Most dangerous in pregnancy= Hep E
- A 38-week pregnant woman visited her family in a remote area after which she developed jaundice and deranged LFT. Which type of hepatitis is most likely prevalent in the pregnant women=Hep E
  - It also comes as
    - A 38-week pregnant woman develops jaundice and deranged LFT. Likely type? = Hepatitis E
    - A 26-year-old pregnant female presents at 36 weeks of gestation with bilirubin 5 mg%, SGPT 275 u/l, SGOT 193 u/l. The most life-threatening viral hepatitis to the mother is = Hepatitis E

KNOW THE DIFFERENCE

- A 38-week pregnant woman visited her family in a remote area after which she develops jaundice suddenly. Which type of hepatitis is most likely prevalent in the pregnant women=Hep E
- A 26 years' pregnant lady presents to you at 34 weeks of gestation. On investigation she has deranged LFTS. Most likely cause is=Hep A
- Pregnant lady with raised SGPT, history of visit to Remote village, which hepatitis= Hep E
- A pregnant patient has jaundice. She was anxious and read about a virus that is dangerous if it occurs in pregnancy. The virus could likely be= Hepatitis E

GENERAL HEPATITIS

- Most common cause of liver cirrhosis in adult male is = Hep C
- One of the following organisms is blood-borne = Hepatitis B
- Most common hepatitis transmitted through sexual contact is = Hepatitis B
- Amongst the causes of fatty changes in liver, the most frequent cause in our country is = HBV and HCV
- A patient with jaundice and bilirubin levels: Total = 10.1 mg/dl, conjugated = 9.0 mg/dl, unconjugated = 1.1 mg/dl. Diagnosis = Hepatitis
- Inflammation of portal triads spilling into lobules with liver cell necrosis suggests= Chronic active hepatitis
- A finding of chronic hepatitis on microscopy= Fibrosis
  - It also comes as
    - Most reliable microscopic evidence of chronicity in hepatitis is = Fibrosis
- Asiatic cholangio-hepatitis is most likely caused by = Clonorchis sinensis

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113. THE INFECTIVITY OF HEPATITIS B PATIENT ON SEROLOGY IS SHOWN BY= HBE ANTIGEN + AND HBE ANTIBODY NEG.

REMEMBER SEROLOGICAL PATTERNS OF HEP-B

STAGE	HBsAg	HbeAg	Anti-HBc	Anti-HBs
Acute Infection	Positive	Positive	Positive (IgM)	Negative
Chronic Infection	Positive	Positive	Positive (IgG)	Negative
Immune from Previous Infection	Negative	Negative	Positive	Positive
Immune from Vaccination	Negative	Negative	Negative	Positive
Window Period	Negative	Negative	Positive (IgM)	Negative

NOW LET'S DISCUSS SOME PAPER MCQ'S

- *The lab reports of a pregnant lady showed HBsAg –ve, Anti-HBc +ve, IgM -ve. These results indicate = Past exposure*
    - *It also comes as*
        - *A 25-year-old lady with HBs antigen: non-reactive, anti-HBc total: reactive, anti-HBc IgM: non-reactive, anti-HBe reactive. Cause? = Past HBV exposure*
- Anti-HBc positive, HBsAg negative, HBeAg negative denotes? = Window period
- Test to determine previous vaccination status for hepatitis B? = Anti-HbS antibodies
- A positive HBsAg indicates? = High incidence of chronic Hep B
    - It is also asked as
        - A person is said to be a chronic carrier of Hepatitis B virus if the HBsAg persists in serum for? = More than 6 months
- IgM+, HBsAg+, HBeAg+ = Acute Hepatitis B
    - It also comes as
        - A patient with known HBV infection comes with HBsAg +ve, HBeAg +ve, HBcAb IgM +ve. What is the diagnosis = Acute hepatitis
- The serological report indicating the increased risk of transmitting HBV infection is = HBeAg +ve and HBeAb -ve
    - It is also asked as
        - A patient diagnosed and treated for hepatitis. What findings will show possibility of high transmission of infection? = HBeAg+ and HBeAb-
- A 44-year male medical technician presented with malaise and fatigue. There is history of jaundice 10 years ago. LFTs were ALT 140, AST 137, total bilirubin 1.8, Direct bilirubin 0.8. Further investigation reveals fibrosis with lamina of hepatocyte destruction, hepatocellular ballooning, and inflammation of triads seen. Which test will lead to the diagnosis? = HBsAg

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114. COMMON CAUSE OF HCC (HEPATOCELLULAR CARCINOMA) IN PAKISTAN=HEP C

NOTE THAT

- The third most common cause of cancer worldwide.
- Chronic hepatitis B is the most common cause of HCC worldwide
- While Chronic hepatitis C being the most common cause in Europe and in Pakistan
- Other Risk factors include:
    - Alcoholic and non-alcoholic fatty liver disease
    - Autoimmune disease
    - Hemochromatosis
    - α1-antitrypsin deficiency
    - Wilson disease and
    - Specific carcinogens (e.g., aflatoxin from Aspergillus).
- Findings: jaundice, tender hepatomegaly, ascites, polycythemia, anorexia.
- Spreads hematogenously.
- Diagnosis: ↑α-fetoprotein; ultrasound or contrast CT/MRI, biopsy

NOW LET'S DISCUSS SOME PAPER MCQ'S

- One of the common predisposing factors for primary hepatocellular carcinoma is= Hepatitis C viral infection
    - It also comes as with different options
        - Most common known cause of hepatocellular carcinoma in developing country is= Both hepatitis B and hepatitis C
        - Most common cause of hepatocellular carcinoma= Hepatitis C (Hep C > aflatoxin)
        - Aflatoxin B1 is implicated most commonly in=Hepatocellular carcinoma
        - Farmer had HCC. Cause= Aflatoxin

    - Which of the following is caused by aflatoxin= Hepatocellular carcinoma
- A patient having HCC gave history of working in a pipe factory. What is the risk factor=Vinyl chloride
- Significantly raised AFP is characteristic of= Hepatocellular carcinoma
  - It is also asked as
    - Tumor marker for Hepatocellular carcinoma= Alpha fetoprotein
    - Which of the following is normally present in amniotic fluid but raised in Hepatocellular carcinoma= Alpha fetoprotein
    - Alcoholic patient with raised LFTs and raised AFP is characteristic of= Hepatocellular carcinoma
- A 23-year-old man wants to increase his muscle mass for playing physical contact sports. He attempts to accomplish this by injections of a substance obtained from a 'friend'. Over the next year he develops acne, icterus, and increased fatigue. An infertility workup reveals hypospermia. Laboratory studies show Hb 19.2 g/dL, HCT 58.1%, platelet count 330,300/microliter, and WBC count 7410/microliter. Which of the following neoplasms is he at greatest risk for developing in the future= Hepatocellular carcinoma
  - It is also asked as
    - Patient took some drug to strengthen his physique for sport activity; after a few months, his hemoglobin became 19, hematocrit 50%, with icterus, acne, and azospermia. Which tumor is he at risk of= Hepatocellular carcinoma
    - A 23-year-old man using anabolic steroids develops acne, icterus, and fatigue. He is at greatest risk for developing= Hepatocellular carcinoma
- A previously alcoholic person develops cirrhosis. With no recent history of alcohol consumption, the patient is yet at risk of= Hepatocellular carcinoma
- A patient with positive HBsAg, negative HBsAb, AFP of 107, and hepatic nodule on ultrasound likely has= Hepatocellular carcinoma
- The most common hepatic malignancy is= Metastasis to the liver
- Hypercalcemia is NOT a feature of= Hepatocellular carcinoma
- The most likely cause of liver cancer in an alcoholic man is = Chronic alcoholism

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115. A 44-YEAR MALE MEDICAL TECHNICIAN PRESENTED WITH MALAISE AND FATIGUE. THERE IS HISTORY OF JAUNDICE 10 YEARS AGO. LFTS WERE ALT 140, AST 137, TOTAL BILIRUBIN 1.8, DIRECT BILIRUBIN 0.8. FURTHER INVESTIGATION REVELS FIBROSIS WITH LAMINA OF HEPATOCYTE DESTRUCTION, HEPATOCELLULAR BALLOONING AND INFLAMMATION OF TRIADS SEEN. WHICH TEST WILL LEAD TO THE DIAGNOSIS= HBSAG

FORSUCH QUESTIONS REMEMBER

- ✓ Autoimmune hepatitis---- anti-smooth muscle antibodies.
- ✓ Councilman bodies---- Seen in viral hepatitis
- ✓ Mallory bodies---- Found in alcoholic liver disease and fatty liver
- ✓ Ballooning degeneration--- Seen in viral hepatitis and fatty liver disease.
- ✓ Interlobular duct injury---- Seen in primary biliary cholangitis
- ✓ Granulomas---- Found in sarcoidosis, tuberculosis, and primary biliary cholangitis
- ✓ Piecemeal necrosis---- Seen in chronic hepatitis (viral or autoimmune)

NOW LET'S DISCUSS SOME PAPER MCQ'S

- An adult complaining of dyspepsia and loss of appetite with h/o alcohol consumption. Liver biopsy revealed alcoholic liver disease. The likely characteristic feature seen on biopsy will be= Mallory bodies
  - It is also asked as
    - A 50-year male presents with jaundice. Labs shows increased AST, and liver biopsy reveals presence of Mallory bodies. Thes ~~findings~~ are highly suggestive of which disease= Alcoholic hepatitis

- ❖ A 40-year known alcoholic male. His lab shows Raised ALP and bilirubin. ALT was raised twice than normal and GGT was raised 6 times than normal. What will be seen on microscopic examination of liver= Piecemeal necrosis
- ❖ A 60-year chronic alcoholic jaundiced with chronically enlarged liver, deranged LFTS, congested neck veins, centrilobular congestion, necrosis and early fibrosis The cause of such histological findings of liver are= Chronic alcoholism
- ❖ Inflammation of portal triads which spills into adjacent lobules bands of inflammation extending between portal areas and terminal hepatic veins and foci of liver cell necrosis throughout the lobule is most likely of? = Chronic acute hepatitis
- ❖ A 39-year-old male smoker and alcoholic presented with abdominal pain, ascites, raised bilirubin, and AFP. Risk factor? = Alcoholic hepatitis
- ❖ A man with a few days of breathlessness died. Autopsy shows deranged ALT, AST, bilirubin, and lipid droplets in hepatocytes. Likely diagnosis? = Chronic alcoholism
- ❖ A middle-aged patient with heavy drinking and ascites. Liver biopsy finding? = Disorganized liver architecture
- ❖ In a patient with chronic hepatitis C and increased ALT and AST levels, what is the most probable cause of the elevated AST and ALT? = Hepatocyte membrane damage
- ❖ What is the expected finding in the liver of an alcoholic patient with normal lab results= Steatosis (fatty liver)
- ❖ Most common cause of fatty liver in Pakistan=Increase fatty food intake
    - ○ Also know that.
        - ▪ The most likely cause of fatty liver in kwashiorkor is= Protein deficiency
- ❖ A 6-year-old child presents with apathy, peripheral edema, and an enlarged fatty liver. Lab results: Hb: 8, TLC: $12x10^9$, Platelets: $150x10^9$, Serum Albumin: 28 (low). What is the most likely cause of the fatty liver= Protein deficiency leading to decreased lipoprotein synthesis

ONE CONFUSING MCQ

✓ A 62-year-old man is brought to the emergency room in a disoriented state. Physical examination reveals jaundice, splenomegaly, and ascites. Serum levels of ALT, AST, alkaline phosphatase, and bilirubin are all elevated. A liver biopsy demonstrates alcoholic hepatitis with Mallory bodies. These cytoplasmic structures are composed of interwoven bundles of which of the following proteins= Intermediate filaments

- ○ This MCQ came in Nov 2020 papers ---taken from Lippincott's Illustrated Review of Rubin's Pathology SECOND EDITION page: 12 MCQ # 10

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116. A FEMALE PATIENT HAS JAUNDICE, PRURITUS AND XANTHOMA. O/E HEPATOSPLENOMEGALY IS PRESENT. WHAT IS THE BEST INVESTIGATION FOR THIS PATIENT=ANTI-MITOCHONDRIAL ANTIBODY

NOTE THE BILIARY TRACT DISEASE

- ❖ Clinical features:
    - ○ Pruritus, jaundice, light-colored stool, dark urine, hepatosplenomegaly.
    - ○ Typically, with cholestatic pattern of LFTs (↑ conjugated bilirubin, ↑ cholesterol, ↑ ALP).

Primary Sclerosing Cholangitis	❖ Is rare except in association with inflammatory bowel disease, especially ulcerative colitis. ❖ Characteristics include inflammation, fibrosis (classically known as "onion skin fibrosis"), and stenosis of intrahepatic and extrahepatic bile ducts. It eventually develops into biliary cirrhosis.
Primary Biliary Cirrhosis	❖ Autoimmune reaction ❖ Features: Mnemonic: 3M's. ○ Most common in Middle-aged women. ○ Anti-Mitochondrial antibodies (98% of patients and are highly specific ○ ↑ serum IgM

	❖ Characteristics include severe obstructive jaundice, itching, and hypercholesterolemia. ❖ Hypercholesterolemia leads to cutaneous xanthoma formation. ❖ Associated with other autoimmune conditions (eg, Sjögren syndrome, Hashimoto thyroiditis, CREST, rheumatoid arthritis, celiac disease).
Secondary Biliary Cirrhosis	❖ Due to extrahepatic biliary obstruction, → ductal injury & inflammation. ❖ Complications → ascending cholangitis and bacterial inflammation of ducts.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ A 40 yr. male presented with jaundice and generalized itching. His LFT shows Direct Bilirubin 11 mg/100 ml, SGPT 75U/L, Alkaline Phosphate 2300 IU/L 500IU/L. The most likely cause is = Extra hepatic Cholestasis
    - o It is also asked as
        - ▪ A pt presented with jaundice, generalized pruritus with elevated direct bilirubin, and elevated ALP. Diagnosis is = Extrahepatic cholestasis
- ❖ A female patient has jaundice, pruritus and xanthoma. O/E Hepatosplenomegaly is present. What is the best investigation for this patient = Anti-mitochondrial antibody
    - o It is also asked as
        - ▪ A 58-year woman has felt increasingly lethargic over the past 3 or 4 years and has noticed that her eyes look 'yellow'. She has recently been diagnosed with hypothyroidism for which she takes replacement therapy. She has no previous medical history but occasionally takes chlorpheniramine. Which single autoantibody is most consistent with the diagnosis = Anti-mitochondrial antibody
- ❖ A 40-year-old housewife is brought to the hospital with severe abdominal pain. History and clinical examination reveal that she is a case of acute biliary colic. Which of the following drugs should also be prescribed, besides morphine, to provide good pain relief in this patient? = Hyoscine butylbromide
    - o It is also asked as
        - ▪ A 40-year female brought to ER with severe abdominal pain was diagnosed as acute biliary colic. Which drug, besides Morphine will provide good analgesic relief? = Hyoscine butyl bromide
- ❖ Pt with a Hx of colectomy 6 years back presents with complains of icterus, pruritus and jaundice. Destruction of intrahepatic ducts seen on cholangiography and liver biopsy shows intrahepatic fibrosis. What is the diagnosis=Primary sclerosing cholangitis
    - o It also comes as where options are different ---for this read theory above
    - o A patient with history of total colectomy presents with icterus, pruritus, intrahepatic biliary obstruction and occult test is negative. Liver biopsy shows onion skin lesion. What is the diagnosis=Ulcerative colitis

OTHERS

- ❖ A patient presented with pallor right hypochondriac pain and deep jaundice. Bloods show raised conjugated bilirubin, increased ALP and Hb 7. What is the probable diagnosis=Pigment stone
- ❖ A young lady has gall stone which has caused blockage of bile duct. This will lead to= Increase fat content of stool

---

117. FOLLOWING IS MOST COMMONLY TRANSFUSED THROUGH BLOOD TRANSFUSION = HEPATITIS

KNOW THE DIFFERENCE

- ❖ Most common post transfusion is hepatitis—if asked specifically then hep B
- ❖ Most dangerous/Lethal post transfusion is CMV.
- ❖ Most common route of transmission of HBV and HCV is through= infected needles > blood transfusion

PAST PAPER BCQ

- ❖ After an abdominal surgery blood was transfused to a patient, after which he developed jaundice, vomiting and lethargy. Hepatitis was diagnosed. Which is most commonly transmitted via blood transfusions= Hep B
- ❖ Most common organism spread by blood transfusion and its products= Hepatitis B virus
- ❖ CMV is a common agent transmitted in blood transfusion. Which method should be adopted for its prevention= Screening of blood for CMV
- ❖ Most lethal post blood transfusion is=CMV

118. 2 WEEKS LATER OF GETTING DIAGNOSED WITH HEPATITIS A, THE LIVER BIOPSY WILL SHOW=NORMAL HISTOLOGY

REMEMBER

- ❖ Chronic hepatitis is characterized for how many duration=6 months
- ❖ A patient is called chronic carrier if he has HBsAg=For more than 6 months
- ❖ The histopathology slide of a women with chronic Hep C for many years will show=Fibrosis and periportal fibrosis
- ❖ Finding of chronic hepatitis on microscopy= Fibrosis
- ❖ The chronicity of liver disease is determined by which histological feature= Fibrosis

PULMONOLOGY

119. THE FUNCTIONAL RESIDUAL CAPACITY = VOLUME OF AIR IN THE LUNGS AT THE END OF TIDAL EXPIRATION

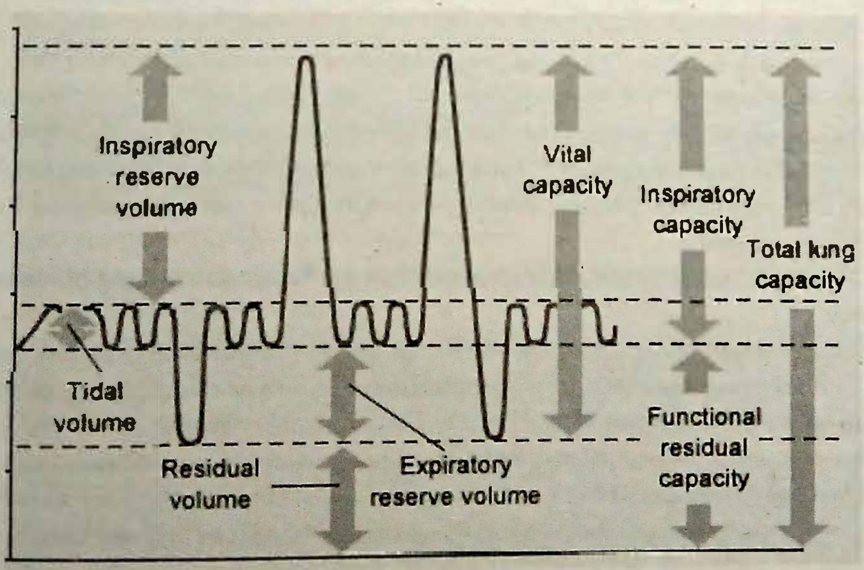
Also remember.

LUNG VOLUMES

Tidal volume (V_T/TV)	❖ Is the volume inspired or expired with each normal breath.
Inspiratory reserve volume (IRV)	❖ Is the volume that can be inspired over and above the tidal volume
Expiratory reserve volume (ERV)	❖ Is the volume that can be expired after the expiration of a tidal volume
Residual volume (RV)	❖ Is the volume that remains in the lungs after a maximal expiration ❖ Cannot be measured by spirometry.

LUNG CAPACITIES

Inspiratory capacity	❖ TV + IRV ❖ The total amount of air that can be drawn into the lungs after normal expiration.
Functional residual capacity (FRC)	❖ ERV + RV ❖ Is the volume remaining in the lungs after a tidal volume is expired
Vital capacity (VC), or forced vital capacity (FVC)	❖ IRV + TV + ERV ❖ Is the volume of air that can be forcibly expired after a maximal inspiration
Total lung capacity (TLC)	❖ Is the sum of all four lung volumes ❖ Is the volume in the lungs after a maximal inspiration



NOW LET'S SOLVE SOME PAPER MCQ'S

TIDAL VOLUME

- ❖ The tidal volume in a healthy adult at rest is about = 0.5 L
- ❖ The average tidal volume in a newborn weighing 2.3 kg is = 15 ml

- The partial pressure of CO2 in expired/alveolar air when dead space is 1/3rd of tidal volume is = 30 mmHg
- Abnormal cyclical changes in tidal volume suggest = Cheyne-Stokes breathing

RESIDUAL VOLUME

- The residual volume in the lung: = Is the gas remaining in the lungs at the end of a full expiration
    - It also comes as
        - The volume of air left in the lungs after a forceful maximal expiration is = Residual volume
- An increase in airway resistance is associated with an increase in: = Residual volume
- A man of 30 years with chronic obstructive lung disease is advised to have spirometry. Which of the following volumes will NOT be measured by the spirometry = Residual volume
- Increased parameter in obstructive lung disease = Residual volume
- Which of the following prevents the lungs from being collapsed = Residual volume
- In a normal healthy adult the amount of air left in the lungs after maximum forced expiration is about= 1200 ml

INSPIRATORY CAPACITY

- How to calculate Inspiratory capacity? = Inspiratory reserve volume (IRV) + tidal volume (TV)
- The volume of air inspired with a maximal inspiratory effort and exhaled out with each expiration is = Inspiratory capacity.
    - It is also asked as
        - A person inspired forcefully and then expired as a normal breath. What capacity would have been used? = Inspiratory capacity
- Inspiratory neurons are located in= Dorsal medullary center.
- In obese patients, which lung volume is decreased? = Inspiratory capacity

FUNCTIONAL RESIDUAL CAPACITY (FRC)

- Functional Residual capacity is sum of = ERV + RV
    - It is also asked as
        - The functional residual capacity is composed of the: = Expiratory reserve volume and residual volume
- The functional residual capacity (FRC) = Is the volume of air in lungs at the end of tidal expiration
    - It is also asked as
        - After tidal volume expired, remaining volume is known as = Functional residual capacity
        - What is true about FRC? = Amount of air remained in lung after expiration of tidal volume
- In a patient with a history of asthma and wheezy chest, the parameter most likely increased is = Functional residual capacity
- The condition which would increase in obstructive but not in restrictive lung disease is = Functional residual capacity
- When the respiratory muscles are relaxed, the lungs are at = Functional residual capacity (FRC)
- At functional residual capacity (FRC), the intrapleural pressure and lung recoil pressure are = Equal in magnitude but opposite in direction
- An obese person gets short of breath and tired on mild exertion. It was related to the lung volumes and which one will change= Decrease FRC
-

VITAL CAPACITY

- The maximum volume of air expired forcibly after maximal inspiration is = Vital capacity
    - It also comes as
        - Vol. of air maximally expired after deep inspiration = Vital capacity
- Vital capacity decreases in? = Weakness of inspiratory muscles
- Vital capacity less than 80% occurs in = Restrictive lung disease

- One of the following can reduce the vital capacity = Decreased total lung capacity

TOTAL LUNG CAPACITY

- In pregnancy, which of the following occurs? = Decrease in total lung capacity
- One of the following can reduce the vital capacity = Decreased total lung capacity
- What is the total lung capacity of an adult male? = 6 liters

120. DEAD SPACE DECREASED IN = ATELECTASIS

NOTE

- Pattern of breathing has no effect on dead space but if asked, dead space does not change in → answer is shallow breathing

Increased Dead space	Decreased Dead space
❖ Emphysema	Atelectasis
❖ Neck Extension	Neck Flexion
❖ Bronchoconstriction	Bronchodilation
❖ ETT intubation	Tracheostomy
❖ Standing	Sleep
❖ Smoking	Hyperventilation
❖ Hypotension	Supine Position
❖ Diseases such as Pneumonia, ARDS, Bronchitis, Asthma, Cardiac Failure, Pulmonary Embolism	

SOME PAST PAPER MCQ'S

- Dead space is the portion of inspired air which does not take part in gaseous exchange with the pulmonary capillary blood. It is decreased in= Tracheostomy
- Volume of the dead space remains unchanged in= Shallow breathing
    - It is also asked as
        - In which of the following conditions does the dead space remain unchanged = Shallow breathing
- The disadvantage of the shallow breathing is that it decreases= Volume of air reaching the alveoli
- The physiological dead space is= Often increased in lung disease
- Physiological dead space is increased in = Hypotension
- Which one of the following diseases decreases physiological dead space? = Atelectasis
- Increase in V/Q occurs in = Increased dead space
- The respiratory dead space = Filters, humidifies, and warms the inspired air
    - It also comes as
        - Which of the following is important regarding dead space= Conditioning of inhaled air

---

121. DURING INSPIRATION TRANSVERSE DIAMETER OF THORACIC CAVITY INCREASES. THE MUSCLE RESPONSIBLE FOR INCREASE IN THE TRANSVERSE DIAMETER IS = EXTERNAL INTERCOSTAL MUSCLES

QUICK SUMMARY OF INSPIRATION AND EXPIRATION

- **INSPIRATION**
    - Active process.
    - Primary muscle: Diaphragm (C3–C5), increases **vertical thoracic** diameter by descending.
    - External intercostals and accessory muscles:
        - Used during exercise or respiratory distress.

- Accessory muscles: Pectoralis major/minor, serratus anterior, scalene, sternocleidomastoid.
- Movements:
    - Pump-handle: Increases **anteroposterior** diameter.
    - Bucket-handle: Increases **transverse** or lateral diameter.

❖ **EXPIRATION:**

- Normally passive due to elastic recoil.
- Active during:
    - Exercise.
    - Conditions with increased airway resistance (e.g., COPD, asthma).
- Muscles used:
    - Abdominal muscles: Push diaphragm up, compress lungs.
    - Internal intercostals: Pull ribs downward and inward.

SOME PAST PAPER MCQ'S

QUIET RESPIRATION

- ❖ Quiet inspiration involves contraction of mainly = Diaphragm
- ❖ A healthy 45-year-old man was sitting relaxed in his lawn reading the newspaper on Sunday morning. The muscles he is using for quiet breathing during this relaxed state are = Diaphragm and external intercostals
- ❖ The anteroposterior and vertical diameter of the chest during quiet respiration is increased by = Diaphragm
    - Vertical diameter: Increased by the contraction of the diaphragm, which moves downward during inspiration.
    - Anteroposterior diameter: Increased by the pump-handle movement of the ribs facilitated by the diaphragm and external intercostals during inspiration
- ❖ During quiet respiration, the muscle which increases the vertical diameter of the thorax is = Diaphragm
- ❖ During quiet respiration, the muscle which increases the lateral diameter of the thorax is = External intercostal
- ❖ During quiet breathing, the principal inspiratory muscle involved is = Diaphragm
- ❖ Contraction of diaphragm causes = Increase lung volume

INSPIRATION

- ❖ Muscle of forceful inspiration = Diaphragm, SCM, External intercostal, Serratus anterior & Scalene muscle
- ❖ Which of the following is involved in deep forceful inspiration? = External intercostal
- ❖ Which of the following is the muscle of forceful inspiration? = External intercostal

EXPIRATION

- ❖ During a forced expiration, the actively contracting muscle is = Abdominal muscles (rectus abdominus—no other relevant option)
- ❖ Which of the following is the muscle of forceful expiration? = Internal intercostal

BREATHING ASSISTANCE IN SPECIAL SITUATIONS

- ❖ A man involved in an RTA with multiple rib fractures. He has difficulty in breathing. You notice that his abdomen is moving more during breathing. Which of the muscles is helping him breathe? = External oblique
- ❖ A bullet damaging the mid-cervical vertebra and the person has respiratory breathing difficulty. Which muscle is likely paralyzed? = Diaphragm

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122. **NEONATAL RESPIRATORY DISTRESS SYNDROME IS DUE TO LACK OF= SURFACTANT**

NOTE ABOUT SURFACTANT

- ✓ Synthesized by type-II alveolar cells and consists primarily of dipalmitoylphosphotidylcholine (DPPC).
- ✓ Lines the alveoli and keep alveoli dry.
- ✓ ↓surface tension and ↑ lung compliance (easier to fill).
- ✓ In the fetus, Surfactant may be present as early as gestational week 24 and is almost always present by gestational week 35.
- ✓ Generally, a lecithin: sphingomyelin ratio greater than 2:1 in amniotic fluid reflects mature levels of surfactant.
- ✓ Neonatal respiratory distress syndrome→ ↓ surfactant→ ↓ compliance→ difficult to inflate lungs→ ↓ Ventilation/perfusion defect →ground glass appearance of lung fields

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Collapsed alveoli is a finding in = ARDS
- A preterm baby is found to have Type 2 pneumocytes deficiency. He is to suffer from = ARDS
- ARDS is characterized by = Reduced production of surfactant by Type 2 alveolar cells
    - It also comes as
        - Decreased surfactant leads to = ARDS
- A lady drowned in water. She was taken out and resuscitated, now develops signs of ARDS. The characteristic finding of ARDS in her is = Pulmonary interstitial edema
- Premature baby of 25-week gestation with ARDS = Increase surface tension

SURFACTANT FUNCTION AND DEFICIENCY

- In surfactant deficiency, the most likely finding = Patchy atelectasis
    - It is also asked as
        - Deficiency of surfactant causes = Patchy atelectasis
- Surfactant activity in the lung is most directly related to the prevention of = Atelectasis
- Alveoli do not collapse due to the presence of? = Surfactant
    - It also comes as
        - Regarding alveoli = Surfactant avoids collapse of alveoli
- Pulmonary surfactant increases = Lung compliance
- Surfactant deficiency causes = Increase surface tension and decrease compliance
    - It also comes as
        - Surfactant Deficiency is related to = Decrease lung compliance
        - Which of the following will happen in surfactant deficiency? = Decrease lung compliance
        - Deficiency of pulmonary surfactant causes = Increases lung surface tension
        - Absence of surfactant from the lungs would result in = Decrease in compliance
        - A 27-year-old man develops adult respiratory distress syndrome. The improvement in respiratory function occurred because surfactant increased the = Lung compliance

KNOW THE DIFFERENCE:

- Surfactant deficiency causes = Increase surface tension and decrease compliance (Normally it ↓surface tension and ↑ lung compliance (easier to fill).
- One of the following is NOT a feature of the surfactant: = Increases the surface tension of the alveolar fluid
- A preterm infant has a surfactant deficiency, leading to pulmonary failure. The set of changes present in a preterm infant, compared with a full-term infant, is = Increased alveolar surface tension and decreased compliance

SURFACTANT PRODUCTION

- A 28-weeks pregnant lady with premature labor delivers a baby who developed respiratory distress and was put on a ventilator. A day later CXR showed diffuse pulmonary opacities. What will be the most likely finding of lung tissue? = Decrease lamellar cells in Type 2 pneumocytes
    - It is also asked as
        - Surfactant is secreted by? = Type II pneumocytes
        - Surfactant is secreted by = Type 2 alveolar epithelial cells
        - Surfactant produced by which cells? = Pneumocytes II
        - In respiratory bronchioles, which cells are present that produce a component of surfactant? = Pneumocytes
        - If Type II alveolar cells in the lung are damaged, there will be deficiency of = Surfactant
- A complex mixture of phospholipids (mainly dipalmitoyl phosphatidylcholine), carbohydrates (glycosaminoglycans) and proteins is present in= Surfactant
    - It is also asked as
        - A complex mixture of phospholipids, carbohydrates, and proteins is present in = Surfactant
        - DPPC + carbohydrate + proteins is a content of = Surfactant

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123. A DIABETIC MOTHER'S BABY IS MOST LIKELY TO DEVELOP = RESPIRATORY DISTRESS SYNDROME

About Respiratory Distress Syndrome

Feature	ARDS	NRDS
Definition	Diffuse alveolar damage → ↑ capillary permeability → protein-rich fluid leakage → non-cardiogenic pulmonary edema (normal PCWP).	Hyaline Membrane Disease. Due to surfactant deficiency causing alveolar collapse.
Causes	Shock, sepsis, trauma, aspiration, oxygen toxicity, near drowning, overdose (e.g., heroin).	Surfactant deficiency → ↑ surface tension → alveolar collapse ("ground-glass" appearance).
Complications	SARS virus destroys type II pneumocytes, causing ARDS.	Metabolic acidosis, PDA (low O2), necrotizing enterocolitis.
Risk Factors	-	Prematurity, maternal diabetes (↑ fetal insulin), C-section (↓ fetal glucocorticoids).
Diagnosis	Bilateral lung opacities, PaO2/FiO2 < 300, respiratory failure within 1 week, no HF/fluid overload.	Lecithin:sphingomyelin ratio < 1.5 (≥ 2 is healthy).
Management	Mechanical ventilation (low tidal volumes), treat underlying cause.	Maternal steroids (pre-birth), artificial surfactant for infant.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Pregnant women having fetus with respiratory distress. For lung maturity of fetus, which drug should be given? = Betamethasone (Betamethasone > Dexamethasone for fetal lung maturity)
- Pulmonary surfactant = Is less active in diabetes
- Patient has some pulmonary disease that high amount of pressure is needed to fill the lung. In this condition, the patient has = Decrease compliance
- How can a patient with ARDS be differentiated from congestive cardiac failure (CCF)? = PCWP
- A 36-year-old male patient fell into a river but was rescued. He developed ARDS. What is the characteristic feature of ARDS? = Inverse Inspiratory to expiratory pressure to maintain auto PEEP
- In a patient with ARDS, pathophysiological cause of edema is = Capillary leakage
- Which statement is diagnostic of ARDS? = PaO2: FiO2 < 200
    - It is also asked as

    - A patient with increasing shortness of breath and tachypnea, bilateral pulmonary infiltrates, PCWP <18, PaO2: FiO2 < 200. Diagnosis? = Acute respiratory distress syndrome
- A lady drowned in water, was resuscitated, and developed ARDS. Mechanism? = Interstitial edema
  - It is also asked as
    - A lady drowned in water. She was taken out and resuscitated, develops ARDS. The most likely mechanism is=Pulmonary interstitial edema
- ARDS is most likely associated with = Sepsis
- A person burned inside a room, put on a ventilator, and had bilateral lung crepitations. He is at risk of? = ARDS
- Patient in ICU now develops worsening SOB with symmetrical ground-glass opacities. Likely cause? = ARDS

---

124. PULMONARY VASOCONSTRICTION OCCURS DUE TO = REDUCED ALVEOLAR PO2

REMEMBER

- In all organs, hypoxia causes vasodilation, but it is opposite in lungs, where it causes vasoconstriction.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Pulmonary vasoconstriction occurs due to? = Reduced alveolar PaO2
  - It also comes as
    - The predominant stimulus for activation of hypoxic pulmonary vasoconstriction is: = Decreased PaO2
    - The characteristic feature related to the pulmonary circulation is = Systemic hypoxia causes pulmonary arteriolar constriction
- Hypoxic pulmonary vasoconstriction occurs because pulmonary arteries have? = Oxygen-sensitive potassium channels
  - It also comes as
    - Hypoxic pulmonary vasoconstriction in alveoli through= O2 sensing K channels
- Which of the following occurs at high altitude? = Pulmonary vasoconstriction
  - It is also asked as
    - A person travels from sea level to 5000 altitudes. What will occur= Pulmonary vasoconstriction
    - Increase pulmonary vasoconstriction cause by=High altitude
- Pulmonary artery pressure increases in= Hypoxia
- The most likely cause of increased pulmonary artery pressure is = Hypoxia

KNOW THE DIFFERENCE

- Pulmonary vasoconstriction occurs due to? = Reduced alveolar PaO2
- Hypoxic pulmonary vasoconstriction is accentuated by= Increase pCO2

---

125. STAGNANT HYPOXIA CAUSES = POLYCYTHEMIA

REMEMBER THERE ARE FOUR TYPES OF HYPOXIAS

Type	Definition	Example
Hypoxemic Hypoxia	The oxygen pressure is low	High altitude, abnormal ventilation perfusion
Anemic Hypoxia	Amount of Hb to carry oxygen is low	Blood loss, anemia, CO poisoning
Stagnant Hypoxia	Blood flow to the tissue is low	Heart failure, shock
Histotoxic Hypoxia	Tissue can't utilize O_2	Cyanide poisoning

NOW LET'S DISCUSS SOME PAPER MCQ'S

HYPOXIC HYPOXIA

- Patient with hypoxia, PO2 60 mmHg, Hb 15, no history of poisoning or blood loss. Diagnosis? = Hypoxic hypoxia
  - It is also asked as
    - A patient with hypoxia having PO2 40 mmHg and Hb 15 with no H/O poisoning, trauma, or blood loss. What could be the cause of hypoxia? = Hypoxic hypoxia
    - A patient with Hb 15, oxygen content of Hb 20 ml, alveolar PO2 45, arterial PO2 40, venous oxygen 15. What type of hypoxia is this? = Hypoxic hypoxia
    - A patient having hypoxia shows PO2 in his arterial blood as 70 mmHg. The type of hypoxia most likely in this case is = Hypoxic
    - A patient with hypoxia has an arterial PO2 of 60 mmHg and hemoglobin concentration of 15 g/dl. The type of hypoxia from which he suffers is likely to be = Hypoxic
- The partial pressure of oxygen (PO2) in the arterial blood is greatly decreased in = Hypoxic hypoxia
- Pulmonary fibrosis is likely associated with = hypoxic hypoxia
- Cause of hypoxia due to low PO2 in blood is = Hypoventilation (if in options Hypoxemic Hypoxia, prefer that)
  - It also comes as
    - The cause of hypoxia characterized by a decreased arterial PO2 is = Hypoventilation

STAGNANT HYPOXIA

- Stagnant hypoxia caused by heart failure/cardiogenic shock and causes = Polycythemia
- Stagnant hypoxia occurs in = Polycythemia (no option of heart failure or shock)

ANOXIC AND ANEMIC HYPOXIA

- Earliest symptom of acute anoxic anoxia is = Lassitude
- Hypoxic cell injury occurs due to which of the following? = CO poisoning
- Anemic hypoxia can occur as a result of = Methemoglobinemia
- Hypoxia caused by anemia, which of the following occurs= Oxygen therapy not effective

HYPOXIA AND SHOCK

- In every type of shock, organ failure occurs due to = Tissue hypoxia
- The most important component of shock is = Tissue hypoxia
- Which of the following feature is common to all types of shock= Tissue hypoxia
- Most important factor leading to decreased wound healing is= Tissue hypoxia

---

126. OXYGEN DELIVERY TO TISSUE IS DECREASED BY= CO POISONING

NOTE ABOUT CYANIDE AND CO POISONING

	Cyanide	Carbon monoxide
Introduction	Both inhibit complex IV (cytochrome c oxidase) → hypoxia uncorrected by O2, ↑ anaerobic metabolism. Both cause **pink/cherry-red skin** (postmortem), seizures, and coma.	
Source	Combustion of synthetic products, amygdalin (apricot seeds)	Fires, car exhaust, gas heaters
Signs/Symptoms	Bitter almond odor on breath, cardiovascular collapse	Headache, dizziness, possible bilateral globus pallidus lesions on MRI
Treatment	Hydroxocobalamin (binds cyanide for renal excretion) Nitrites (forms cyanomethemoglobin, less toxic) Sodium thiosulfate (converts cyanide	100% O2, hyperbaric O2.

	to thiocyanate for excretion)	
❖ Effect On Oxygen-Hemoglobin Dissociation Curve	❖ Normal curve; oxygen saturation may initially appear normal	❖ Left shift in curve → ↑ affinity for O2 → ↓ O2 unloading in tissues. ❖ Binds competitively to Hb with 200× greater affinity than O2 to form carboxyhemoglobin → ↓ %O2 saturation of Hb.

NOW LET'S SOLVE SOME PAPER MCQ'S

CYANIDE POISONING

- Nerve metabolism is blocked by = Cyanide
- Many toxins cause cell death by producing injury at the enzymatic level. Cyanide interferes with = Cytochrome oxidase
    - It also comes as
        - Cyanide poisoning will affect which complex of the Electron Transport Chain? = Complex 4 (Cytochrome C oxidase)
        - Patient factory work having cyanide poisoning scenario. What is the underlying electron transport chain or biochemical disturbance? = Complex 4

CARBON MONOXIDE (CO) POISONING

- In which of the following conditions, a tissue cannot utilize oxygen regardless of being provided with enough oxygen? = CO poisoning
- The most likely condition which causes a decrease in arterial O2 saturation without a decrease in O2 tension is = Carbon monoxide poisoning
    - It is also asked as
        - In carbon monoxide poisoning, hyperoxia does not occur due to? = Arterial PO2 remains normal (not decreased)
        - Functional hemoglobin reduction in anemia, carbon monoxide poisoning, or methemoglobinemia will not cause hyperoxia because = Arterial PO2 remains normal
        - Reduction of functional hemoglobin associated with anemia, methemoglobinemia, or carbon monoxide poisoning does not produce hyperpnea because the = PO2 of arterial blood is normal
- The feature of mild Carbon monoxide poisoning is = Decrease ability of O2 to bind hemoglobin
- One of the following shifts oxygen hemoglobin dissociation curve to the left side: = Carbon monoxide poisoning
    - It is also asked as
        - The oxygen hemoglobin dissociation curve shifts to the extreme left by = Carbon monoxide poisoning
- Oxygen delivery to tissue is decreased by = CO poisoning

---

127. RIGHT SHIFT OF HB DISSOCIATION CURVE, IF THERE IS DECREASED IN= PH

REMEMBER

Shifts to Left = Lower oxygen delivery (high O_2 affinity so less delivery to tissues)	**Shifts to Right = Raised oxygen delivery** (low O_2 affinity so raised O_2 delivery to tissues)
❖ Low H+	❖ Raised H+
❖ Low PCO_2 (or increased pH/↓acidity)	❖ Raised PCO_2 (or ↓in pH/↑ acidity)—Bohr effect)
❖ Low 2,3-DPG	❖ Raised 2,3-DPG
❖ Low temperature	❖ Raised temperature
❖ HbF	

<table>
<tr><td>❖ CO poisoning</td><td></td></tr>
<tr><td colspan="2">Note: (About 2,3 DPG)
▪ Present in RBCs, it enhances oxygen release to tissues by reducing Hb's O2 affinity.
▪ Interacts with β-chains of Hb → promotes O2 release.
▪ Fetal Hb lacks β-chains → higher O2 affinity → facilitates O2 transfer from mother to fetus.</td></tr>
<tr><td>❖ Explanation:
1. HbE:
o Structure: α2γ2 (γ-chains replace β-chains).
o Effect: ↑ O2 affinity, resulting in reduced O2 delivery to tissues.
2. <u>CO poisoning</u>:
o Hb affinity for CO is 200× greater than for O2.
o CO binding increases the affinity of remaining Hb sites for O2, causing a leftward shift of the oxygen dissociation curve and impairing O2 release to tissues.</td><td>❖ Explanation:
1. Increased CO2 production lowers tissue pH.
2. Through the Bohr Effect, reduced pH decreases hemoglobin's O2 affinity, enhancing O2 delivery to exercising muscles.</td></tr>
</table>

NOW LET'S DISCUSS SOME PAPER MCQ'S

RIGHT SHIFT OF THE OXYGEN-HEMOGLOBIN DISSOCIATION CURVE

- The oxygen-haemoglobin dissociation curve is shifted to the right by = Acidosis
- Shift of the Hb-O_2 dissociation curve of blood to the right most likely = Occurs in hyperthyroidism
- The factor promoting delivery of more oxygen to the tissues at high altitude is = Shifting of oxygen-haemoglobin dissociation curve to the right
- Right shift of the oxygen dissociation curve occurs with = Decrease pH
    - It is also asked as
        - The shift of oxyhaemoglobin dissociation curve to the right indicates increased unloading of O_2 from hemoglobin. It is due to decreased = pH
        - Right shift of Hb oxygen dissociation curve occurs in decrease of = pH
        - Which of the following will shift the Hb-O_2 dissociation curve to the right? = Decreased pH
- Right shift of the oxygen-hemoglobin dissociation curve = Increased temperature
- Which of the following will shift the Hb O_2 curve to the right? = Increase H^+
    - It also comes as
        - In which of the following there is right shift of the curve? = Acidosis
        - Right shift of Oxy-Hb Curve occurs in = Increase CO_2
- Compared with adult Hb, fetal Hb is different in = Lower affinity for 2,3-bisphosphoglycerate
- Increases 2,3-Diphosphoglycerate effect = Shifts oxygen-hemoglobin dissociation curve to the right
    - There is one more question related
        - Diphosphoglycerate= Product of glycolysis
        - There are two types of diphosphoglycerate:-1, 3 diphosphoglycerate and 2, 3 diphosphoglycerate.
            - -1, 3 diphosphoglycerate is an intermediate in glycolysis.
            - -2, 3 diphosphoglycerate is related to oxygen-hemoglobin dissociation curve.

LEFT SHIFT OF THE OXYGEN-HEMOGLOBIN DISSOCIATION CURVE

- Oxyhemoglobin curve shifts to the left because of = Increased fetal hemoglobin
- What causes shift of oxygen Hb dissociation curve to the extreme left? = CO poisoning
    - It also comes as
        - O_2 dissociation curve extreme left shift due to = CO poisoning

    - ▪ Oxygen dissociation curve shifts towards which side in CO poisoning? = Left side
- Left shift of oxygen-hemoglobin dissociation curve = Hypothermia
- Hb-O_2 dissociation curve shifts to left in = Increased pH

---

128. IN RIGHT SHIFT OF OXYGEN DISSOCIATION CURVE, THE MOST LIKELY VALUE OF P50 WOULD BE= 35 MM HG

NOTE THAT

- ✓ Normal P50: ~26 mmHg (at normal pH, temperature, and CO_2 levels).
- ✓ Right Shift (e.g., increased CO_2, H^+, temperature, or 2,3-DPG): P50 increases (e.g., ~35 mmHg).
- ✓ Left Shift (e.g., fetal hemoglobin, decreased CO_2, H^+): P50 decreases (e.g., < 20 mmHg).

ANOTHER MCQ

- ✓ During transport of CO2 in the blood, the amount of CO2 dissolved in the Plasma at 45mmHg is= 2.7% (Ref: Guyton Pg 502, Ed 12)

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129. THE EFFECT OF OXYGENATION ON CARBOXYHEMOGLOBIN IS BY=LE CHATELIER

ALSO NOTE THAT:

- HaLdane effect= Left shift, bohR effect= Right shift

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Left shift of the oxygen dissociation curve due to low pco2 is known as= Haldane effect
- Shift of oxygen curve to left due to hypocarbia is called= Haldane effect
- Which of the following applies to Bohr effect= Effect of CO2 and H+ on the oxygen affinity of haemoglobin

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130. REGARDING PULMONARY PARAMETERS, WHAT HAPPEN TO THEM IN PREGNANCY= LOW PC02

PHYSIOLOGIC ADAPTATIONS IN PREGNANCY:

- Cardiovascular:
    - ↑ Cardiac output (↑ preload, ↓ afterload).
    - ↑ Heart rate (HR) → Improves placental and uterine perfusion.
- Hematologic:
    - Anemia of pregnancy: Due to ↑ plasma volume (50%) > ↑ RBC mass (25%).
    - Hypercoagulability: Protective adaptation to reduce blood loss during delivery (↑ clotting factors like fibrinogen).
- Respiratory:
    - Minute ventilation ↑ (due to ↑ tidal volume, not respiratory rate).
    - Tidal volume ↑.
    - Total lung capacity (TLC) ↓ slightly (due to diaphragm elevation by the expanding uterus).
    - CO_2 levels ↓ slightly (respiratory alkalosis due to hyperventilation).

NOW LET'S SOLVE SOME PAPER MCQ'S RELATED TO PREGNANCY

- During pregnancy, dyspnea is due to progesterone. What is the finding= Min ventilation increase
- In third trimester of pregnancy, which of the following occurs= Total lung capacity decreased
- In late phase of pregnancy respiratory parameters become= Decrease CO2
    - It also comes as
        - ▪ During pregnancy which of the following decreases= Arterial PCO2
- Most common cause of anemia in pregnancy= Plasma volume expansion
- In pregnancy what is increased= Red cell mass
- Hormone responsible for increased respiratory rate during pregnancy = Progesterone

- A woman at 6 weeks of pregnancy has Hb 12, HCT:25, and a Normocytic Normochromic peripheral film. At 32 weeks she comes for follow-up with Hb 9, HCT 20, and normocytic normochromic peripheral film. What is your diagnosis? = Physiological change
  - It also comes as
    - Scenario of pregnancy in which Hb in 1st trimester was 11.5 but at term it become 9.5 what is cause= Physiological change

---

131. IN PULMONARY EMBOLISM, RESPIRATORY DISTRESS IS DUE TO= V/Q MISMATCH

REMEMBER:

- Zone- 1 (apex) of Lung
  - Ventilation is low, and Blood flow is very low $\frac{\downarrow V}{\downarrow\downarrow Q} = \uparrow V/Q$
  - As a result, PO2 is high and PCO2 is low at apex
- Zone-3 (base) of lung
  - Ventilation is higher, and blood flow is much higher $\frac{\uparrow V}{\uparrow\uparrow Q} = \downarrow V/Q$
  - As a result, PO2 is low and PCO2 is high at base
- V/Q in Airway Obstruction
  - If airway blocked, ventilation is zero and if blood flow normal then $\frac{V}{Q} = \frac{Zero}{Q}$ = ZERO, called shunt
  - So, there is no gas exchange, PO2 and PCO2 of pulmonary capillary blood will approach their values in mixed venous blood
- V/Q in Pulmonary Embolism
  - If blood flow is completely blocked (e.g. by an embolism occluding pulmonary artery), then blood flow is zero, if ventilation normal then $\frac{V}{Q} = \frac{Normal}{Zero}$ =infinity, which is called dead space (anything divided by zero is infinity)
  - So, there is no gas exchange, PO2 and PCO2 of alveolar air will approach their values in nspired air

NOW LET'S DISCUSS SOME PAPER MCQ'S

VENTILATION-PERFUSION (V/Q) RATIO

- At the apex of the lung, which of the following is high? = V/Q
  - It is also asked as
    - At apex of lung, which of the following occurs? = Increased V/Q
    - On standing, which of the following is highest at the Apex of the lung? = V/Q
- Which of the following will help in the diagnosis of COPD? = V/Q mismatch < 0.1
- In zone 1 of the lung (upper zone) = Dead space is high
- During normal inspiration, more air goes to the alveoli at the base of the lung than to the alveoli at the apex of the lung because = The alveoli at the base of the lung are more compliant
- In the supine position, what decreases at the apex of the lung? = Ventilation
  - It is also asked as
    - Decrease of which occurs at the apex of lungs? = Ventilation
- In physiological dead space, the V/Q ratio will be = Infinite
- Physiological shunt will be present when V/Q is = Zero
- Increase in V/Q occurs in = Increase dead space
- Hypoxia at room temp, started 100% oxygen. P alveolar is 670, but PaO_2 (arterial) is 70. What is the likely cause? = V/Q mismatch
- The most common physiological cause of hypoxemia is = Ventilation-perfusion inequality
- A medical student waiting to do her first patient interview at the clinical skills center becomes very anxious and increases her rate of alveolar ventilation. If her rate of CO_2 production remains constant, which of the following will decrease? = $PaCO_2$ in blood

- Which type of hypoxia is associated with decreased PO2 and increased A-a gradient? = Right-to-left shunt

PULMONARY EMBOLISM

- Which of the following will be seen in pulmonary artery embolism? = Increase V/Q ratio
    - It also comes as
        - A clot in the pulmonary artery will cause = Increase V/Q ratio
- Three days after delivery, a woman died because of pulmonary embolism. There was a blockage at the pulmonary artery, which resulted in? = V/Q ratio achieves infinity
- A 49-year-old man has a pulmonary embolism that completely blocks blood flow to his left lung. As a result, which of the following will occur? = Alveolar PO_2 in the left lung will be approximately equal to the PO_2 in the inspired air
- A pulmonary embolism that blocks blood flow to the left lung will result in = Alveolar pO2 in the left lung approximately equal to pO2 in the inspired air
- Pulmonary embolism leads to respiratory failure, the most likely mechanism is = Ventilation-perfusion mismatch

KNOW THE DIFFERENCE

- V/Q ratio increases in = Pulmonary embolism
- V/Q ratio decreases in = Pulmonary edema

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132. RESPIRATORY STIMULUS BY IS MEDULLARY CENTRE, FURTHER RATE AND DEPTH IS CONTROLLED BY= PNEUMOTAXIC CENTRE

CENTRAL CONTROL OF BREATHING

<table>
<tr><td>Cerebral Cortex</td><td>Breathing can be under voluntary control, can hold breath or can take rapid breath and can result in hypoventilate or hyperventilate</td></tr>
<tr><td>Medullary Respiratory Center</td><td>Located in Reticular Formation
<table>
<tr><th>Dorsal Respiratory Group</th><th>Ventral Respiratory Group</th></tr>
<tr><td>Responsible for inspiration</td><td>Responsible for expiration</td></tr>
<tr><td>Input comes from vagus and glossopharyngeal nerve</td><td>Not active during normal breathing</td></tr>
<tr><td>Output travels via phrenic nerve to diaphragm</td><td>Active when expiration is active e.g. Exercise</td></tr>
</table></td></tr>
<tr><td>Apneustic Center And Pneumotaxic Center</td><td>
<table>
<tr><th>Apneustic Center</th><th>Pneumotaxic Center</th></tr>
<tr><td>Is located in the lower pons.</td><td>Is located in the upper pons.</td></tr>
<tr><td>Stimulates inspiration</td><td>Inhibits inspiration</td></tr>
<tr><td>Producing a deep and prolonged inspiratory gasp (apneusis)</td><td>Therefore, regulates inspiratory volume and respiratory rate</td></tr>
</table></td></tr>
</table>

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Which group of neurons, inactive normally, are activated in medulla during increased breathing= Ventral
- The respiratory center is present in the dorsal nucleus in medulla. The rate and duration of inspiration is controlled by= Pneumotaxic center
- Inspiratory neurons are located in= Dorsal medullary center
- Inspiratory ramp signals are produced from dorsal respiratory neurons. their rate increases in response to impulses from= Pneumotaxic center
- The stimulatory effect of decreased arterial PO2 on the respiratory center is through: = peripheral chemoreceptors in carotid and aortic bodies.

- The stimulatory effect of increased H+ concentration in the arterial blood on the respiratory center is through: = Peripheral chemoreceptors in carotid body
- Atropine does NOT cause one of the following effects. = Stimulates respiratory center
- Vagus nerve proximal end cut, stimulation of the central part causes what? = Cause apnea
- During the first minute of apnea, pCO2 rises up to = 6 mmHg
- Brief apnea after ventilation support with 60% oxygen is due to = Low arterial O2 suppressing peripheral chemoreceptors.

133. PERIPHERAL CHEMORECEPTORS RESPOND TO= DECREASE O2

CHEMORECEPTORS FOR C02, H+ AND O2

- Central Chemoreceptors:
  - Location: Medulla
  - Stimulus: ↓ CSF pH (↑ PCO_2 → H^+ production).
    - Mechanism: CO_2 diffuses into CSF → forms H^+ → stimulates chemoreceptors → ↑ breathing rate.
    - Effect: Hyperventilation reduces PCO_2, returning levels to normal.
- Peripheral Chemoreceptors:
  - Location: Carotid bodies (carotid bifurcation) and aortic bodies (near aortic arch).
  - Stimulus:
    - ↓ PO_2 (< 60 mmHg) → ↑ breathing rate.
    - ↑ PCO_2 → ↑ breathing rate.
    - ↓ pH (acidosis) → stimulates carotid bodies → ↑ breathing rate.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Decrease O2 in blood is sensed by= Carotid body
- Peripheral chemoreceptors respond to= Decrease O2
  - It also comes as
    - The stimulatory effect of decreased arterial PO2 on the respiratory center is through= Peripheral chemoreceptors in carotid and aortic bodies
- A pt put on ventilation support was given 60% oxygen and 40% nitrogen. After taking of the patient from ventilator support, there were brief episodes of apnea before getting back to normal. This is likely due to= Low arterial O2 suppressing peripheral chemoreceptors
- ABGs show pCO2: 70, pO2: 90, HCO3 raised. This picture is due to which mechanism= Stimulation of central chemoreceptors
- A patient with myasthenia gravis develops paralysis of the respiratory muscles that increases his PaCO2 from 40 to 60 mmHg and hydrogen ion concentration in arterial blood from 40 mEq/L to 50 mEq/L. One the following events is most likely to happen in this patient= Central chemoreceptors would be stimulated
- Both peripheral and central chemoreceptors contribute to increased ventilation as a result of? = An increase in arterial PCO2
  - It is also asked as
    - Central Chemoreceptors respond to? = Increase PCO2
    - Central Chemoreceptors respond to? = PCO2

ALSO NOTE THESE MCQ'S

- Capnometer is used to measure pCO2. What else can it be used for= Useful in air embolism
- A person doing regular exercise. What factor in this condition increase his respiratory rate= Proprioceptors
- In stable COPD disease= Chemoreceptors become less sensitive to PCO2

134. ALVEOLAR VENTILATION DECREASED BY=HERING BEURER REFLEX

OTHER TYPES OF RECEPTORS FOR CONTROL OF BREATHING

Lung stretch receptors (Hering–Breuer reflex)	❖ The longest known lung reflex is the Hering-Breuer reflex (inflation reflex), ❖ The Hering-Breuer reflex is initiated by lung expansion, which excites stretch receptors in the airways. Stimulation of these receptors, which send signals to the medulla by the vagus nerve, shortens inspiratory times.
Irritant receptors	❖ Located between the airway epithelial cells, stimulated by noxious substances (e.g., dust and pollen).
J (juxtacapillary) receptors	❖ Located in the alveolar walls, close to the capillaries. ❖ Engorgement of the pulmonary capillaries, as in LHF, stimulates it causing rapid, shallow breathing

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Hearing Breuer reflex will lead to inhibition of= Dorsal neuron of central respiration
- Hering-Breuer reflex is activated by= Stretch receptors in bronchioles and bronchi
- Herring Breuer reflex is an increase in=Duration of expiration
- Alveolar ventilation decreased by? = Hering-Breuer reflex
- Irritant receptors in the airways= Are involved in coughing and bronchoconstriction
- A healthy 23-year-old woman reports coughing paroxysms when air temperature is below freezing. Which sensory receptors are most likely to have triggered this response= Irritant receptors
  - This MCQ by CPSP is taken from book of Physiology by Robin R. Preston unit V, page 312

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135. IN ACUTE EXACERBATION OF ASTHMA, WHICH RESPIRATORY PARAMETER DECREASES? = FEV1

ABOUT OBSTRUCTIVE AND RESTRICTIVE LUNG DISEASES

Obstructive lung disease:

- Examples: COPD, asthma, chronic bronchitis
- Pulmonary function test changes:
  - FEV1 decreased significantly
  - FVC normal or slightly decreased
  - **FEV1/FVC ratio <70 percent**

Restrictive lung disease:

- Examples: Pulmonary fibrosis, obesity, scoliosis
- Pulmonary function test changes:
  - FEV1 and FVC both proportionately decreased
  - **FEV1/FVC ratio normal or slightly increased (≥70 percent)**

NOW LET'S DISCUSS SOME PAPER MCQ'S

- What is the Normal value of FEV1/FVC? = 0.8
  - Normal FEV1/FVC Values:
    - Adults: ≥70% (between 0.75 to 0.80)
    - Pediatrics: ≥85% (slightly higher than 80% in younger individuals due to more elastic lungs).
    - Elderly (>65 years): ≥65% (due to age-related loss of lung elasticity).
- A 35-year male with 83% Fev1? = Normal lung
- How to differentiate between obstructive lung disease and restrictive lung disease = FEV1/FVC
  - It is also asked as
    - The lung function test parameter differentiating obstructive and restrictive lung disease is: = FEV1 / FVC ratio
- During an attack of bronchial asthma, the most likely finding on pulmonary function test will be = Reduced FEV1
  - It also comes as

- In a young man of 20 suffering from bronchial asthma, lung function tests were performed. The most likely finding will be = FEV1/FVC < 75%
- Which PFTs findings are closely related to a patient of bronchial asthma=FEV1/FVC <65

- ❖ A patient with restrictive lung disease is likely to have a normal value of = FEV1 / FVC ratio
- ❖ Restrictive lung disease causes? = Decreased lung compliance, increased FEV/FVC ratio
- ❖ A male performing ETT test, reached his peak cardiac activity of 112beats/min. He started feeling dyspneic with sudden drop in saturation from 96% to 88% (FEV/FVC ≥0.7%). The diagnosis is? = Restrictive
- ❖ A patient with 1-year history of shortness of breath presents with cough O/E wheeze hyper resonant chest increased dullness decrease vocal fremitus but no crepitation PFTs show decreased FEV/FVC and also decreased lung elastase What inhaled substance is the cause of increased activity of neutrophil elastase = Nicotine
- ❖ A 66-year-old man has had increasing dyspnea for about a year. He is a smoker. He is retired from the construction business. There are some rales auscultated in both lungs on physical examination. A chest radiograph reveals bilateral diaphragmatic pleural plaques as well as diffuse interstitial lung disease. A sputum cytology shows no atypical cells. Pulmonary function studies reveal a low FVC and a normal FEV1/FVC ratio. These findings are most likely to suggest prior exposure to which of the following environmental agents? = Asbestos crystals
- ❖ A patient with cough, dyspnea, and decreased FEV1, decreased FRC, decreased FVC suffers from? = Pulmonary interstitial fibrosis
- ❖ Pulmonary parameter decreased in kyphosis with weak respiration? = FEV1

KNOW THE DIFFERENCE

- ❖ Which parameter doesn't change in restrictive lung disease= FEV1/FRC
- ❖ A patient with chronic obstructive lung disease has decreased= FEV1/FVC ratio

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136. A 7-YEAR-OLD WITH COUGH AND MUCUS, INCREASED EOSINOPHILS. CXR SHOWS HYPERINFLATION. THE DIAGNOSIS IS = BRONCHIAL ASTHMA

BRONCHIAL ASTHMA

- ❖ Extrinsic (Immune):
  - ○ Type-1 hypersensitivity (IgE), childhood onset, family history of allergies.
  - ○ Features: Cough, wheezing, dyspnea, tachypnea, pulsus paradoxus, hypoxemia, status asthmaticus.
  - ○ Pathology: Bronchial smooth muscle hypertrophy, submucosal gland hyperplasia.
- ❖ Intrinsic (non-immune):
  - ○ Triggered by chronic bronchitis, exercise, or cold; adult onset; no family history.
  - ○ Pathology: Submucosal gland hyperplasia, ↑ REID index.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ In sensitized atopic asthma, antigen in bronchus first binds to = Mucosal mast cells
- ❖ Symptoms of asthma after exposure occurred due to = Histamine
- ❖ A patient presents with a severe form of atopic asthma. Which of the following changes would most likely be found in this patient's blood? = Eosinophilic leukocytosis
- ❖ In atopic asthma, the cells visualized are = Eosinophilic leukocytosis
- ❖ A patient presented with cough, dyspnea, and wheezing episodes for 2 years, with thick sputum but no fever history. Investigations revealed increased eosinophils and CXR shows hyperinflation. Diagnosis = Bronchial asthma
- ❖ A 50-year-old patient has undergone appendicectomy. He has a history of asthma. Which drug will be safe for providing postoperative analgesia? = Pethidine
- ❖ The mechanism of action of Theophylline in bronchial asthma is = Phosphodiesterase inhibition

- Curschmann's spirals and Charcot-Leyden crystals are seen in = Bronchial asthma
- Muscle relaxant that can be safely given to an asthmatic patient = Cisatracurium besilate
- An asthmatic patient on Salbutamol, Prednisolone, and Ipratropium bromide for the past 9 months was started on Diazepam for arthritis since 7 days. In the office, he falls in the elevator suddenly leading to a fracture of the humerus without any major trauma. Which one of the following is responsible for the fracture? = Prednisolone
- An asthma patient with a respiratory rate of 30/min and dyspnea. What will be the finding? = Decrease $PaCO_2$
- Which drug causes bronchodilation through adenylyl cyclase = Salbutamol
- Asthma involves which part of the tract? = Medium-sized bronchioles
- A 60-year-old man with a history of chronic bronchial asthma reports to OPD. Lung volumes and capacities are most likely to match this case on spirometry by = VT=300 ml, FEV1=2000 ml, FVC=3200 ml
- Which antihypertensive drug should be given to an asthmatic patient during surgery? = IV hydralazine
- In a patient with an acute severe attack of bronchial asthma, treatment should commence with? = Salbutamol nebulization
- During the early stages of an asthmatic attack: = Arterial carbon dioxide tension increases
- A painter presented in ER with worsening SOB, he feels good on holiday. The most appropriate Dx? = Occupational asthma
- A patient presents with bronchial asthma characterized by episodic shortness of breath, wheezing, and chest tightness. To confirm reversibility of airway obstruction, a pulmonary function test (PFT) is performed, measuring FEV1 (forced expiratory volume in 1 second) before and after administering a Beta-2 agonist. What percentage increase in FEV1 is considered significant in this patient= 12% increase in FEV1

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137. BLUE BLOATER OCCURS IN = CHRONIC BRONCHITIS

ABOUT CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

- Definition: Chronic, progressive airflow limitation due to chronic bronchitis and/or emphysema, mostly caused by smoking.
- Features: Chronic cough, dyspnea, sputum, wheezing, with exacerbations triggered by infections/irritants.
- Pathophysiology: Airway obstruction (chronic bronchitis) and alveolar destruction (emphysema) → air trapping, hyperinflation, reduced gas exchange.
- **Chronic Bronchitis ("Blue Bloater"):**
    - Productive cough > 3 months/year for > 2 years.
    - Features: Cyanosis, crackles, hypercapnia, secondary polycythemia.
    - Pathology: Mucus hypersecretion, submucosal gland hyperplasia, smoking related.
- **Emphysema ("Pink Puffer"):**
    - Centriacinar:
        - Smoking-related; affects upper lobes.
        - Elastase → elastic fiber loss → ↑ lung compliance.
        - Features: Barrel chest, pursed-lip breathing
    - Panacinar:
        - Linked to α-1 antitrypsin deficiency; affects entire acinus to terminal bronchioles.

NOW LET'S DISCUSS SOME PAPER MCQ'S

EMPHYSEMA

- Alpha-1 antitrypsin deficiency = Emphysema
    - It is also asked as
        - Familial emphysema is most closely associated with = Alpha-I antitrypsin deficiency

- A non-smoker female diagnosed with Alpha-1 antitrypsin deficiency. Which part of the respiratory tract would be most affected? = Alveolar duct
- The pulmonary disease most commonly associated with smoking, resulting in enlarged, overinflated lungs due to destruction of alveolar walls = Emphysema
- The cause of a barrel-shaped chest on CXR is due to = Emphysema
- Emphysema patient shows = Increased lung volume
- Respiratory acidosis occurs in = Emphysema
- A patient with emphysema presented with chest pain, decrease air entry on left side, and trachea shifted to the left and desaturation. The investigation of choice is = CXR

CHRONIC BRONCHITIS

- A 60-year-old man has a 90-pack-year history of smoking. For the past 5 years, he has had a cough productive of copious amounts of mucoid sputum for months at a time. His last episode of pneumonia is complicated by septicemia and brain abscess and he dies. At autopsy, his bronchi microscopically demonstrate mucus gland hypertrophy. Which of the following conditions is most likely to explain his clinical course? = Chronic bronchitis
- A COPD patient on O_2 pressure at 10 cm of water by PEEP for 24 hours would cause? = Pneumothorax
- A 70-year-old patient with a history of COPD is admitted to the hospital with worsening respiratory acidosis. The renal excretion of potassium will = Fall, since tubular secretion of potassium is inversely coupled to acid secretion
- Which of the following conditions causes hypoventilation? = COPD
- In stable COPD disease= Chemoreceptors become less sensitive to PCO2
- Histologically, diagnostic features in a pt with known COPD (chronic bronchitis) is=Hypertrophy and hyperplasia of mucus secreting glands

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138. AN ELEVATED SWEAT CHLORIDE TEST IS DIAGNOSTIC OF = CYSTIC FIBROSIS

CYSTIC FIBROSIS (CF):

- Autosomal recessive disorder caused by CFTR gene mutation (chromosome 7), affecting hydration and electrolyte transport in exocrine glands.
- Respiratory symptoms: Chronic cough, recurrent pneumonia (initially Staphylococcus aureus, later Pseudomonas), nasal polyps, sinusitis.
- Gastrointestinal symptoms: Pancreatic insufficiency (85%), meconium ileus, pancreatitis, rectal prolapse.
- Diagnosis: Clinical features plus sweat chloride test (>60 mmol/L), CFTR gene mutations, or increased nasal potential difference.
- Treatment: Vaccination, high-calorie diet, pancreatic enzyme replacement, antibiotics, and lung transplantation as definitive therapy

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Child with diarrhea and recurrent chest infections. Family Hx is also positive. What test should be done to detect the cause? = Sweat chloride test
- An 18-month-old boy with elevated sweat chloride test likely has = Cystic fibrosis
- A 4-year-old boy presented with clinical features of failure to thrive, recurrent sinusitis, otitis media, and RTI. He also gives a history of chronic diarrhea, and there is a family history of such complaints as well. Chloride sweat test was positive, leading to a diagnosis of? = Cystic fibrosis
- A 4-year boy presented with clinical features of failure to thrive, recurrent sinusitis, otitis media and RTI. He also gives h/o chronic diarrhea and there is family h/o such complaints as well. Chloride sweat test was positive leading to a diagnosis of? = Cystic fibrosis
- Likely diagnosis in a young patient with dyspnea, diarrhea, and clubbing = Cystic fibrosis

- A 4-year child known case of Cystic fibrosis suffers from repeated infections caused by pseudomonas aeruginosa Which pulmonary complication is she likely to develop = Bronchiectasis
  - It is also asked as
    - Patient with cystic fibrosis, they were asking what patient will develop = Bronchiectasis
    - A child known case of cystic fibrosis presented with acute respiratory infection. On investigation the organism diagnosed as pseudomonas Aeruginosa. What other findings are associated with the patient= Bronchiectasis
- Scenario of recurrent respiratory infection and chronic diarrhea = Cystic fibrosis
- A child diagnosed with cystic fibrosis developed bronchiectasis. Causative agent = Pseudomonas aeruginosa
- Saliva findings in cystic fibrosis = Increased chloride
  - It is also asked as
    - What will be different in the saliva of a cystic fibrosis patient? = More chloride than sodium
- A 13-year young patient admitted in emergency with complain of dyspnea and diarrhea. O/E Clubbing was noted. What is your diagnosis= Cystic fibrosis

ALSO NOTE THESE MCQS

- Sinusitis, bronchiectasis, and situs inversus are most closely associated with= Kartagener's syndrome
- A child with a long-standing cough, clubbing, anemia, low weight, and no response to ATT. X-ray shows tram track sign. Diagnosis=Bronchiectasis
- During quiet breathing, the principal inspiratory muscle involved is = Diaphragm
- Contraction of diaphragm causes = Increase lung volume
- If a patient had tidal volume 500 ml and lung capacity increased, so that tidal volume becomes 1000 ml, what are we measuring in this patient? = Lung Compliance
- Man on ventilator, what will happen if you give positive expiratory force? = Gas redistribution
- Measurement of peak expiratory flow rate? = Produces a reading which is normally at 450-650 ml/min in the adult

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139. MESOTHELIOMA IS ASSOCIATED WITH = ASBESTOS

REMEMBER WHEN ASKED

- Mesothelioma ----- Ans= Asbestos
- Asbestos ----- Ans= Bronchogenic CA
- Bronchogenic CA ----- Ans= Smoking
- Smoking ----- Ans= Bronchogenic CA

ALSO REMEMBER

- Construction factory/Occupational carcinoma =Asbestosis
- Coal mining/mining, sand blaster. = Silicosis

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Patient works in demolition of old buildings, develops dyspnea. CXR shows diffuse interstitial fibrosis of lungs, iron-stained strings and beads were also seen. Diagnosis will be = Asbestosis
- A known smoker and construction worker with respiratory problems. X-ray shows plaque-like lesion on lungs. The likely cause is = Asbestosis
- Among the inorganic substances, one of the following compounds usually behaves as a carcinogen = Asbestos
- One of the following occupations is associated with a higher incidence of cancer = Asbestos workers
- Fibrovascular tissue leak with layers of mesothelium. What structure could it possibly be? = Lung
- A student was given a slide for microscopic examination. He concluded it to be mesothelium epithelium. The specimen could possibly be of = Lungs

- A coal mine worker is assigned for stone polishing and sand blasting. He might develop which of the following diseases in the future? = Silicosis
- The type of pneumoconiosis most commonly associated with dusts encountered in the mining of coal is = Silicosis

MALIGNANCIES ASSOCIATED

- A 59-year construction worker has a history of asbestos exposure. Which of the following malignancies is most likely to occur in this man? = Malignant mesothelioma
- Mesothelioma is most commonly associated with exposure to = Asbestos
- A 32-year-old construction worker, who is also a smoker, has been exposed to asbestosis for several years. He presents to you concerned about his risk for cancer. He is at greatest risk of developing = Bronchogenic carcinoma
- Greatest cancer risk in a construction worker exposed to asbestosis? = Bronchogenic carcinoma
- Asbestos and tobacco together most likely cause = Bronchogenic carcinoma

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140. A ROCK-CRUSHER DEVELOPED HILAR LYMPHADENOPATHY. ON BIOPSY, BIREFRINGENT PARTICLES PRESENT. DIAGNOSIS= SILICOSIS

REMEMBER THE FOLLOWING MNEMONIC

- **Asbestos** is from the **roof** (was common in insulation), but affects the **base** (lower lobes).
- **Silica** and **coal** are from the **base** (earth), but affect the **roof** (upper lobes).

Asbestosis	❖ Associated with shipbuilding, roofing, plumbing ❖ Affects lower lobes ❖ Associated with ↑incidence of lung cancer (bronchogenic carcinoma > mesothelioma).
Berylliosis	❖ Affects upper lobes ❖ Associated with exposure to beryllium in aerospace and manufacturing industries. ❖ Granulomatous on histology and therefore occasionally responsive to steroids.
Anthracosis	❖ Inhalation of carbon dust, Endemic in urban areas and causes no harm
Coal workers' pneumoconiosis	❖ Affects upper lobes ❖ Inhalation of coal dust, which contains both carbon and silica, Also known as black lung disease.
Silicosis	❖ Affects upper lobes ❖ Associated with glass manufacturers, and stone cutters. Sandblasting, mines. ❖ It is thought that silica may disrupt phagolysosomes and impair macrophages, increasing susceptibility to TB. ❖ "Eggshell" calcification of hilar lymph nodes

NOW LET'S DISCUSS SOME PAPER MCQ'S

- A nonsmoker pt. presented with chest heaviness, cough and hemoptysis on investigations he was diagnosad as a case of lung cancer. Which of the following environmental agent exposure leads to his disability= Radon
  - (Ref F Aid general patho, Radon second leading coz of lung CA after smoke, and there is no history of asbestos exposure)
  - In such scenario if person is smoker prefer smoking---otherwise radon
- A non-smoker male with no other risk factors had a non-productive cough for 2 months. Now presented with blood-streaked sputum. O/E he has bilateral wheeze. CXR shows a 5 cm hilar mass in the left lung with hemorrhagic pleural effusion. Sputum shows hyperchromatic, pleomorphic cells with scanty cytoplasm. What is the most likely cause? = Radon exposure

- A patient presented with history of cough with sputum for 5 months O/E there is right lung expiratory wheeze X-ray shows small perihilar lymph node involvement Biopsy shows Squamous Cell Ca Cause = Radon gas

ASBESTOSIS:

- Lower lobe lesion in plumber man= Asbestos
- Scenario of pt with 5cm opacity in left lower lung lobe, cause is=Asbestosis
- Which of the following is related to cancer=Asbestosis
- Carcinoma is caused by which inorganic compound= asbestos
- Which of following is commonly caused by asbestos= Bronchogenic carcinoma
- Pt works in demolition of old buildings, develops dyspnea. CXR shows diffuse interstitial fibrosis of lungs, iron strained strings and beads were also seen. Diagnosis will be=Asbestosis
- A man working in a construction company presents with complaints of cough and shortness of breath. CXR shows pleural plaques. Most likely the cause is=Asbestosis
- A Pt. who is indulged in Demolition of Old buildings develops dyspnea recently. CXR showed diffuse interstitial Fibrosis of Lungs bilaterally. On histology, iron s of the cells was positive. Most likely diagnosis= Asbestosis
- Asbestosis causes= Pleural mesothelioma
- A smoker patient, was having interstitial lung disease and pleural plaque= Asbestosis

SILICOSIS

- A 40-year-old mine worker admitted with complaint of progressive breathlessness, productive cough, night sweats, and weight loss for two months. Chest X-ray reveals hilar lymphadenopathy and tuberculin skin test is positive. The most likely diagnosis is = Silicosis
- A rock crusher presented with severe cough and shortness of breath. Biopsy shows birefringent particles. What is the most likely diagnosis? = Silicosis
- Inhaled constituent of the Earth's crust that most consistently produces pulmonary fibrosis = Silica
- Coal mining sand blaster = Silicosis
- Silicosis is commonly seen in workers of = Sand blasting
- Workers digging deep into the earth's crust commonly present with pulmonary fibrosis. This is likely due to abundance of which element in the earth's crust? = Silica
- A man with silicosis presented with pulmonary nodules. Mechanism of formation of nodules is = Giant cell formation
- Man inhaling silica dust for 6 years, develops cough, 1 cm mass on X-ray. What cells may be seen? = Foreign body giant cells

SILICOSIS AND TUBERCULOSIS (SILICO-TUBERCULOSIS)

- A patient with B/L hilar lymphadenopathy and pulmonary TB is diagnosed. He gives a history of working in mines for many years. Cause is = Silicosis
- A man working in a coal mine came with history of low-grade fever, dry cough, and weight loss. CXR showed right apical consolidation. Mantoux positive and ESR 90. What is the probable diagnosis? = TB
- A patient working in a mine presented with cough, fever, and weight loss. On examination, tuberculin test positive with hilar lymphadenopathy. Diagnosis is = TB
    - Know this
        - A 40 years old mine worker admitted with complaint of progressive breathlessness, productive cough, night sweats and weight loss for two months. Chest x-ray reveals hilar lymphadenopathy. tuberculin skin test is positive. The most likely diagnosis is= Silicosis (No option of tuberculosis in this mcq)

OTHERS:

- A man with weight loss and lesion in the lung, now presents with hemoptysis and histology shows small cells clusters (morphology of neoplastic cells), Causative agent =Smoking

- A coal worker presented with SOB and fatigue for the past 1 month. CXR shows pleural effusion and nodular opacities. Diagnosis=Pneumoconiosis

141. FARMER RT LUNG CALCIFICATION=ASPERGILLOSIS

NOTE THAT

Disorder	Source	Antigen/Agent
Farmer's lung	Mouldy hay or Grain dust	Micropolyspora faeni Aspergillus fumigatus Saccharopolyspora rectivirgula
Bird fancier's lung	Avian excreta, proteins and feathers	Avian serum proteins
Byssinosis	Textile industries	Cotton dust,
Inhalation ('humidifier') fever	Contamination of air conditioning	Thermophilic actinomycetes
Malt workers		Aspergillus clavatus

- Investigation:
  - Blood: NO eosinophilia
    - (Exception Allergic bronchopulmonary aspergillosis (ABPA)—hypersensitivity response to Aspergillus growing in lung mucus. Associated with asthma and cystic fibrosis; may cause bronchiectasis and eosinophilia)

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Farmer lung disease is due to = Grain dust
- Main cause of Farmer's lung is due to microorganism = Micropolyspora faeni
- A patient has complaints of chest issues and a history of working in a textile mill for 20 years. Most probably he is suffering from = Byssinosis
  - It also comes as
    - Byssinosis occurs in people working in = Textile industry (cotton)

ASPERGILLOSIS

- A farmer presented with a right lower lobe coin-like mass of 3.4 cm in size. The most common cause is = Aspergillosis
- Farmer with right lung calcification = Aspergillosis
- - A gardener with a rounded calcified opacity in the lung likely has = Aspergillosis
- Gardener presented with chronic cough. CXR shows a 2.5 cm calcific mass. Diagnosis = Aspergillosis
  - It is also asked as
    - A man who is a gardener for the last 15 years presents with a sore throat for 1 week. He gives a history of previous chest pain with no other symptoms. CXR showed a round calcified mass in the right lung lower lobe. Diagnosis is = Aspergillosis
    - An Australian gardener for the past 15 years presents with sore throat and fever. His chest X-ray showed a round, calcified mass in the right lung lower lobe. The diagnosis is = Aspergillosis
    - A gardener presents with a sore throat and a CXR showing a round calcified mass in the right lung lower lobe. The diagnosis is = Aspergillosis
- The serology test for Aspergillus? = Galactomannan
  - It is also asked as
    - Diagnostic test for Aspergillosis is = Galactomannan
    - Aspergillus is diagnosed by = Galactomannan

- ❖ A farmer is suffering from nasal congestion, severe cough, and episodic dyspnea. On CXR, the physician found a mass. His IgE and eosinophils levels are increased. It is due to = Aspergillosis
  - o It is also asked as
    - ▪ Nasal congestion, severe cough, episodic dyspnea, and increased IgE and eosinophils are due to = Aspergillosis
    - ▪ A woman with perihilar nodules, elevated IgE, and eosinophilia likely has = Non-invasive aspergillosis
    - ▪ Farmer suffering from nasal congestion, severe cough, and episodic dyspnea. On CXR, the physician found a mass. His IgE and eosinophils levels are increased. It is due to = Aspergillosis
    - ▪ A 41-year-old woman has a 1-year history of episodic dyspnea. On physical examination, there are expiratory wheezes. Her chest radiograph shows a few small 0.5 cm perihilar nodules. Laboratory studies show an elevated serum IgE along with peripheral blood eosinophilia. A sputum sample shows eosinophils. The most likely pathologic finding in her bronchi = Non-invasive aspergillosis
- ❖ 12-year-old child presents with cough and wheezing for the last 7 years. X-ray shows bilateral bronchiectasis. Examination shows thick sputum containing eosinophils. Most likely cause is = Aspergillosis
- ❖ Repeated infections in a child with skin abscesses and Aspergillosis are due to = Defective NADPH oxidase

PNEUMOCONIOSIS

- ❖ A man with no cough and fever, CXR shows diffuse lung fibrosis = Inorganic dust
- ❖ A 40-year male presents with shortness of breath and slowly progressive cough. CXR shows diffuse interstitial fibrosis. Likely cause is=Inorganic dust
  - o This also comes as
    - ▪ A non-smoker presented with progressive dyspnea but no cough over 15 years. X-ray show diffuse interstitial patches in all over the lungs. Rest of the examination is normal. Diagnosis=Inorganic dust
    - ▪ A man presents with shortness of breath. CXR shows diffuse interstitial fibrosis. Likely cause is= Inorganic dust
    - ▪ A 50-year-old man has had increasing dyspnea for 12 years, but no chronic cough. On physical examination, he is afebrile. A chest radiograph reveals diffuse interstitial fibrosis involving both lungs. These findings are most likely produced by which of the following environmental exposures? = Inorganic dusts

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142. A PATIENT WITH A HISTORY OF BONE MARROW TRANSPLANT 2 YEARS BACK NOW DEVELOPED HEMOPTYSIS AND MALAISE. CT SHOWS THE PRESENCE OF A FUNGAL BALL WITH SEPTATE AND BRANCHING HYPHAE. THE LIKELY CAUSE IS = ASPERGILLOSIS

QUICK NOTES

- ❖ Septate hyphae: Aspergillosis.
- ❖ Non-septate hyphae: Mucormycosis.
- ❖ Pseudohyphae: Candidiasis.
- ❖ Fungal growth and necrotic debris: Suggestive of invasive fungal infection.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ A non-diabetic female with history of bone marrow transplant 2 years back now developed chronic rhino sinusitis, hemolysis and malaise. CT shows presence of a fungal ball with septate and branching hyphae at acute angle. The likely cause is= Aspergillosis
  - o It also comes as

    - A patient with history of bone marrow transplant 2 years back now developed hemoptysis and malaise. CT shows presence of a fungal ball with septate and branching hyphae. The likely cause is= Aspergillosis

- A Young girl with nasal polyp. CT shows presence of a non-septate hyphae with right angle branching. The likely cause is= Mucormycosis
- A 50-year female pt undergoing chemotherapy due to CA breast presented with complains difficulty in swallowing due to a sore throat. O/E cheesy mucosal plaques in his mouth and white oropharynx pseudohyphae are seen on pass stain of a mucosal smear. These findings are consistent with diagnosis of= Candidiasis
    - It is also asked as
        - Patient presented with difficulty in swallowing, on examination there are white growth inside esophagus with pseudohyphae, likely reason is= Candidiasis
- A lady chronic alcoholic lady presents with severe pleuritic chest pain, 6kg weight loss in 5 months but no fever. CXR shows bilateral reticulonodular infiltrates. Microscopy showed epithelial necrotic debris. Labs showed raised neutrophils and within range lymphocytes. What will be further be found on histology= Fungal growth

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143. RHINOSINUSITIS REPORTS INVASION OF LAMINA MEDIA, EXTENSIVE ENDOTHELIAL DAMAGE, AND THROMBOSIS. THE MOST LIKELY DIAGNOSIS IS = MUCORMYCOSIS

ABOUT MUCORMYCOSIS

- Risk Factors: Common in DKA and neutropenia (e.g., leukemia).
- Pathogenesis: Inhaled spores invade blood vessels, penetrate the cribriform plate, and can spread to the brain.
- Features: Rhinocerebral infection, frontal lobe abscess, cavernous sinus thrombosis, headache, facial pain, black necrotic eschar, cranial nerve involvement.
- Treatment: Surgical debridement with amphotericin B or isavuconazole.

MUCORMYCOSIS MCQS

- Which organism causes a fungal infection that invades and cause rhinosinusitis or cause thrombosis= Mucormycosis
- Histopathology of an specimen from a patient suffering from invasive fungal rhinosinusitis reports invasion of lamina media, extensive endothelial damage and thrombosis. The most likely diagnosis is= Mucormycosis
- A patient with chronic rhinosinusitis suffers from acute fungal infection which invades the lamina papyracea and excessive endothelial damage. The organism involved is= Mucormycosis
- A patient with diabetic ketoacidosis did not respond to treatment and died in a hospital. Autopsy examination showed inflammatory lesions in the kidneys, brain and heart with some fungal elements. The most likely organism in this case would be= Mucormycosis
- A finding of facial pain, headache and black necrotic eschar in the nasal cavity in a patient with DKA are highly suggestive of= Mucormycosis
- A diabetic patient presented with increasing degree of progressive illness involving respiratory system. What can be the cause= Mucormycosis
- Invasive fungal rhinosinusitis with lamina media invasion and thrombosis is most likely = Mucormycosis

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144. HILAR LYMPHADENOPATHY, NON-CASEOUS GRANULOMA, MULTISYSTEM INVOLVEMENT, HYPERCALCEMIA. WHAT IS DIAGNOSIS= SARCOIDOSIS

NOTE THAT

- Non-caseating granuloma= sarcoidosis
- Common feature of sarcoidosis in females= Erythema nodosum
- Granuloma with asteroid bodies= sarcoidosis

- Sarcoidosis is diagnosed microscopically by = Non Caseating Granuloma > Granuloma with Asteroid Bodies.
- Type of cells involved in sarcoidosis= T-lymphocytes

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Sarcoidosis is diagnosed microscopically by = Non-caseating granuloma
    - It is also asked as
        - A 49-year-old female with shortness of breath and dry cough is found to have hilar lymphadenopathy on chest x-ray. Biopsy of one of the lymph nodes reveals non-caseating granulomas. Diagnosis is = Sarcoidosis
        - A 49-year-old female with shortness of breath and dry cough is found to have hilar lymphadenopathy on chest x-ray. Biopsy of one of the lymph nodes reveals non caseating granulomas along with asteroid bodies. Diagnosis is = Sarcoidosis
        - Scenario of person with rash on forearms, hilar nodes, noncaseating granuloma = Sarcoidosis
        - A lady with chronic dry cough and hilar lymphadenopathy, AFB negative. Diagnosis is based on = non-caseating granuloma
        - Granulomatous lesion without caseation necrosis is most likely due to = Sarcoidosis
- Schaumann bodies are found in = Sarcoidosis
- How is sarcoidosis differentiated from tuberculosis? = Symmetrical B/L hilar lymphadenopathy
- Common feature of sarcoidosis in females? = Erythema nodosum
    - It is also asked as
        - Most characteristic finding of sarcoidosis in female is = Erythema nodosum
- Sarcoidosis scenario was given i.e. low-grade fever, hypercalcemia stones with B/L lymphadenopathy histopathological findings were asked = Non-caseating granuloma
- A female with renal colic, non-caseating granulomas, and bilateral hilar lymphadenopathy (sarcoidosis). The cells involved are = T lymphocytes
    - It is also asked as
        - Female with non-caseating granuloma and Hilar lymphadenopathy (sarcoidosis). The type of cells involved are = T lymphocytes
        - A 35 years old lady gives 5-6 months history of low-grade fever and malaise. The bronchial biopsy revealed multiple non-caseating granulomas. This condition is most likely due to abnormality in the function of = T lymphocytes
- The microscopic diagnosis of sarcoid lesion is based on the presence of = Granuloma with asteroid bodies
- A patient with cervical lymphadenopathy. CXR shows bilateral hilar lymphadenopathy. Biopsy shows typical granuloma with granulomatous necrosis in submandibular and sublingual gland. Diagnosis is= Sarcoidosis

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145. INTERSTITIAL LUNG DISEASE WITH NON-CASEATING GRANULOMA & HILAR NODES =SARCOIDOSIS

ALSO REMEMBER THAT

- Caseating granuloma= T.B
- Non-caseating granuloma= sarcoidosis
- Granuloma with yellow pigment = Actinomycosis
- Granuloma with abscess= Actinomycosis
- Granuloma with suppuration= Nocardia fungus

ALSO NOTE THAT

- Ghon complex found in= TB

NOW LET'S DISCUSS SOME PAPER MCQ'S

TUBERCULOSIS

- Primary TB granuloma complex is = Granuloma with surrounding lymphatic
- Ghon complex in primary TB is = Granuloma with associated lymphatics
- Ghon complex is a feature of= Primary TB
- Mycoplasma pneumonia
- Ghon complex are seen in= TB
- The caseating granulomatous inflammation is seen most commonly in = Tuberculosis
    - It also comes as
        - A 20-year-old female presents with cervical lymphadenopathy. The histological examination of the lymph node showed granulomata. The diagnosis of tuberculosis in this case is strongly suggested due to the presence of one of the following findings = Caseation necrosis
- A patient with cervical lymphadenopathy, CXR shows Bilateral Hilar Lymphadenopathy. Biopsy shows caseating epithelioid granulomatous pattern. Diagnosis = Tuberculosis
    - It also comes as
        - A patient with cough, fever for last 3 months and cervical lymphadenopathy and he also has non-healing ulcer on tongue. Histology shows granuloma with caseous necrosis. The hilar lymph sign on chest x-ray is normal. What is the diagnosis? = TB
- Microscopic section of a lesion excised from a 22-year-old male reveals a granulomatous lesion without caseation necrosis. The LEAST likely disease to be a cause of such lesion is = Tuberculosis

ACTINOMYCES AND OTHER GRANULOMATOUS DISEASES

- A diabetic patient after tooth extraction develops an abscess. On histology, the characteristic feature of Actinomyces is? = Granuloma with abscess
    - It is also asked as
        - A diabetic with jaw-draining abscess. Pus C/S shows gram +ve bacilli in chains. Histological findings seen will be? = Granuloma with Abscess
        - A diabetic with jaw draining abscess. Histological findings seen will be =Granuloma with Abscess
        - The characteristic microscopic feature of Actinomyces infection is = Granuloma with abscess
- The most common cause of granuloma with suppuration is = Nocardia

GRANULOMAS IN GENERAL

- Granulomas contain? = Lymphocytes + macrophages
- Granulomatous lesion without caseation necrosis in excised lymph node of 22-year-old male suggests = Sarcoidosis
- A patient with cough and fever whose chest X-ray shows small infiltrates and microscopic findings of granulomatous inflammation with lymphocytes and neutrophils, but no necrosis, likely has = Sarcoidosis
- The type of necrosis in which granuloma with epithelioid cells is seen? = Caseous
- Microscopic feature of granuloma is? = Caseous necrosis
- A patient presented with edematous face, granulomatous cheilitis, on examination there is facial paralysis and deep fissures on tongue. Diagnosis = Melkersson-Rosenthal Syndrome
- A 45-year-old healthy woman has a routine check of her health status. Which of the following biologic characteristics best distinguishes this lesion as a neoplasm, rather than a granuloma? = Uncontrolled (autonomous) growth
- Transformation of macrophages to epithelioid cell in chronic granulomatous inflammation is mainly brought about by which one of following= Interferon gamma
    - (Ref: Robbins and Cotran Review of Pathology E-Book page 20, unit 1)

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146. A 49-YEAR-OLD FEMALE WITH SHORTNESS OF BREATH AND DRY COUGH IS FOUND TO HAVE HILAR LYMPHADENOPATHY ON CHEST X-RAY. BIOPSY OF ONE OF THE LYMPH NODES REVEALS NON CASEATING GRANULOMAS. DIAGNOSIS IS=SARCOIDOSIS

KNOW THE DIFFERENCE

- How sarcoidosis is differentiated from tuberculosis=Symmetrical B/L hilar lymphadenopathy
- A patient with cough, fever for last 3 months. O/E he has cervical lymphadenopathy and a non-healing ulcer on tongue. Histology shows granuloma with caseous necrosis. CXR shows B/L hilar lymphadenopathy. Diagnosis is=Tuberculosis
- A 35 years old lady gives 5-6 months history of low-grade fever and malaise. A week ago, she had right renal colic. X-ray chest showed bilateral hilar lymphadenopathy and bilateral mid zonal mottling. X-ray abdomen revealed calculi in right kidney. The bronchial biopsy revealed multiple non-caseating granulomas. This condition is most likely due to abnormality in the function of= T lymphocytes
- An alcoholic female presented with Cough with hemoptysis and history of 4 kg weigh loss in last few months. O/E Temp 38.5, pleuritic chest pain. CXR shows B/L perihilar lymphadenopathy. Her alveolar wash shows a few epithelioid cells. CBC Show Neutrophils 78, Lymphocytes 8, Eosinophils 3. What is probable diagnosis=Tuberculosis

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147. CHARACTERISTIC OF TB GRANULOMA= EPITHELOID CELL

REMEMBER FOR T.B DIAGNOSIS:

- Most diagnostic test for TB= PCR > AFB > Caseous.
- If asked histological= Epitheloid > caseous
- If asked microscopic= Caseous > Epitheloid
- Definitive: Sputum AFB
- Initial test for TB= Chest X-ray
- Characteristic/diagnostic of granuloma: Epitheloid

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Langerhans Giant cells are characteristic feature of= Tuberculosis
- Epithelioid cells in tuberculous granuloma are derived from = Macrophages
- Histological feature of TB granuloma is = Epithelioid cell
  - It also comes as
    - The most essential histological feature in a tuberculous granuloma is = Epithelioid cells
    - Which of the following is the most characteristic of granuloma = Epithelioid cell
    - Diagnostic of granuloma = Epithelioid cells
  - It also comes with completely different options
    - Epithelioid cells are seen in which of the following? = Leprosy
- A 35-year-old female presented with infertility. Uterine tubes were blocked, and histology of the endometrium revealed epithelioid and giant cells. The likely cause is = Tuberculosis
- What is the best microscopic feature to diagnose tuberculous granuloma = Caseous necrosis
- A 20-year-old female presents with lymphadenopathy. The histological examination of the lymph node showed granulomata, diagnosis of tuberculosis in this case requires =Presence of caseation necrosis
- Scenario of TB, caseous necrosis is seen. Diagnostic test asked = PCR (PCR > AFB)
- Test for definitive diagnosis of TB is = Demonstration of AFB
  - It is also asked as
    - A 20-year-old female presented with cervical lymphadenopathy. Histological examination of lymph nodes revealed granulomata. A definite diagnosis of TB in this case requires = Demonstration of AFB tissue specimen
    - Inguinal lymphadenopathy patient was having TB. Definitive investigation for diagnosis = AFB
- An old patient with weight loss, patches in lungs, hemoptysis, and epithelioid cells. The next investigation should be = AFB
- A boy came from Afghanistan with discharging sinus in the lateral neck with night sweats and fever. Culture shows no growth. Which next confirmatory test should be done = Biopsy (If biopsy is not in option, prefer ZN staining)

- AFB is non-resistance, non-capsulated due to = Cell wall glycoprotein

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148. A PATIENT PRESENT WITH FEVER AND COUGH SINCE LAST ONE MONTH. BIOPSY SHOWS EPITHELIOID CELLS AND X- RAY SHOWS DIFFUSE NODULAR OPACITIES. WHAT IS THE LIKELY DIAGNOSIS=TUBERCULOSIS

NOTE THESE MCQS OF TUBERCULOSIS

- In which of the following there is lymphocytosis= TB
- Cough. Sore throat, low grade fever. Enlarge cervical lymph node X-ray chest show hilar lymphadenopathy, diagnosis= TB
- A pt. with low grade fever, night sweats, haematuria. Urine R/E shows 25 RBC/HPF. ultrasound unremarkable. Cause= Renal TB
- Antibodies in TB are= Bound to cell
- Air borne infectious disease= TB
- A Pt took ATT drugs for 2 months. Now presented with moderately elevated ESR. This due to= Superimposed acute bacterial infection
- A 50-year-old smoker complains of dry cough, low grade fever and malaise. His chest is clear. On x-ray there is left apical shadow. Mantoux test is positive and ESR is 90mm/hr, Diagnosis= TB
- Finding of pulmonary TB= Primary focus in parenchyma with involvement of regional lymph nodes
- Ghon complex is a feature of=Primary TB
- Most likely cause of negative Mantoux test in pt with TB would be= Immunosuppressive therapy
- Regarding pulmonary TB, what is true= Involves posterior segment of upper lobe lung
- A man working in a mine came with h/o low grade fever, cough. X-ray showed left apical consolidation. Mantoux +ve Dx=TB

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149. PT. ON ATT, CAN'T DIFFERENTIATE BTW RED AND GREEN. WHICH DRUG IS RESPONSIBLE = ETHAMBUTOL

ALSO REMEMBER THE FOLLOWING DRUG EFFECTS

Isoniazid	Peripheral neuropathy, hepatitis	For prevention use pyridoxine (B6)
Rifampicin	Orange-red color secretions	Does not need treatment
Ethambutol	Optic neuritis (color blindness)	Reduce dose or stop Dose needs adjusting in renal impairment too
Pyrazinamide	Hepatitis Photosensitization, Hyperuricemia, gout	
Streptomycin	Vestibular (8th) nerve damage	Used only if patient has multi-drug resistant contraindicated in pregnancy

NOW LET'S DISCUSS SOME PAPER MCQ'S

STREPTOMYCIN

- Which of the following is not safe in pregnancy= Streptomycin
- Which of the following ATT is contraindicated In Pregnancy = Streptomycin
- Which drug is eliminated from body without significant metabolism= Streptomycin

ETHAMBUTOL:

- Ethambutol is an Anti TB drug causing= Optic neuritis
- Which Anti TB drug is bacteriostatic= Ethambutol
- A 58-year-old man is being treated with a six-drug regimen for multi-drug resistant tuberculosis. A month after starting the treatment, he complains of an inability to distinguish between red and green traffic lights. The drug most likely to be responsible for this symptom is: = Ethambutol
    - It also comes as

- A patient is taking multiple drugs to treat his TB. Now he is unable to differentiate between red and green light. Drug responsible for this is=Ethambutol
- Optic neuritis/red green color issues in a T.B patient taking ATT is due to= Ethambutol
- A patient on ATT developed blurring of vision= Ethambutol

ISONIAZID

- Isoniazid induced hepatic injury increased by= N-acetyl cysteine deficiency
- Peripheral Neuropathy in TB is prevented by giving= Vitamin B6
  - It also comes as
    - Patient on ATT pins and needle sensation, what should be given= Vit B6
    - A patient on ATT drugs presents with pin and needle sensations. What drug should be stopped=Isoniazid
    - Peripheral neuropathy is caused by = INH
    - Isoniazid's toxic effects can be prevented by = Pyridoxine
- The most appropriate statement regarding isoniazid is = Possesses toxic effects that can be prevented by pyridoxine
- Isoniazid is poorly metabolized in patients who are genetically deficient in: = Acetyltransferase

RIFAMPICIN:

- Pt on ATT developed red colour urine drug responsible= Rifampicin
- A patient undergoing TB treatment complains of orange-pink discoloration of urine. Which of the following drugs is responsible for it=Rifampicin
- A female on anti-TB drugs using OCPs but still conceive. Which drug is responsible= Rifampicin
- Which drug inhibits transcription? = Rifampicin

PYRAZINAMIDE

- Patient on ATT drug develops right big toe swelling. This is due to which of the following drug= Pyrazinamide
  - It is also asked as
    - A 40-year male on ATT for last 3 weeks presented with acute painful swelling of right big toe. His serum uric acid is raised. Which is the culprit drug? = Pyrazinamide
    - A 40 year old male on anti-tuberculous treatment for last three weeks, complains of joint pains. The drug to be stopped is= Pyrazinamide
    - A 25-year-old man who was put on anti-tuberculosis therapy develops acute painful swelling of the right big toe after two weeks. It is most likely due to the side effect of = Pyrazinamide
- Patient on ATT develops Hyperuricemia. Which drug= Pyrazinamide
  - It also comes as
    - Which of the following anti tuberculosis drugs can cause hyperuricemia=Pyrazinamide

ALSO NOTE THIS

- Why are anti TB drugs given in combination= to decrease resistance emergence

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150. WHICH ANTI TB DRUG IS BACTERIOSTATIC= ETHAMBUTOL

FOR THESE QUESTIONS REMEMBER

- ✓ Pure Bacteriostatic drugs → Ethambutol,
- ✓ Pure Bactericidal drugs → PZA, Rifampin
- ✓ Drug with both properties → INH
  - INH is Bactericidal for Bacilli in rapidly dividing phase
  - But INH is Bacteriostatic for bacilli in Stationary phase.

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151. IN MULTIDRUG RESISTANT TB RESISTANCE IS FOUND WITH= RIFAMPICIN AND INH

NOTE THIS

- Multi-Drug-Resistant TB (MDR-TB)
    - TB which is resistant to isoniazid and rifampicin
- Extensive Drug-Resistant TB (XDR-TB)
    - TB which is resistant to isoniazid + rifampicin (MDR-TB) + any of the fluoroquinolone (such as levofloxacin or Moxifloxacin) and to at least one of the three injectable second-line drugs (Amikacin, capreomycin or kanamycin).

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152. LABORATORY DIAGNOSIS OF LEPROSY IN ITS EARLY STAGE IS PERFORMED BY = NASAL SCRAPINGS FOR LEPRA BACILLI

MCQS ABOUT LEPROSY

- Nasal lesion, hilar lymph nodes, AFB positive. Diagnosis= Leprosy
- A man presented to OPD with complains of a lesion near the orbit of the eye. Histopathology shows giant Langhans Cells. The organism involved is=Tb Leprae
- Initial test to detect microorganism of leprosy is= Nasal scrapping test
    - It also comes as
        - Laboratory diagnosis of leprosy in its early stage is most commonly by= Nasal scrapings for lepra bacilli
- A biopsy of intraocular tissue shows necrosis and Langerhans cells. The diagnosis is? = Tuberculoid leprosy
- One of the following statements concerning drugs used in leprosy is INAPPROPRIATE: = Clofazimine should not be given to patients who are intolerant to dapsone or who fail to improve during treatment with dapsone

KNOW THE DIFFERENCE

- A 30 yr. old female with saddle nose, granulomatous perforating lesion of nasal septum, vasculitis & proteinuria. The most likely lesion is= Wegener granulomatosis
- A young man presented with low grade fever for the last three months. On examination, his nasal bridge was distorted and cervical lymph nodes were palpable. Histology of these lymph nodes revealed non-caseating granuloma and positive AFB stain. The most likely diagnosis is=. Leprosy

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153.

154. PNEUMONIA IN IMMUNOSUPPRESSANT= PNEUMOCYSTIS JIROVECII

REMEMBER

Community-Acquired Pneumonia (CAP):	❖ Occurs before or within 48 hours of hospital admission. ❖ Common agents: ○ Streptococcus pneumóniae (most common) ○ H. influenzae & Staphylococcus aureus
Hospital-Acquired Pneumonia (HAP) (Nosocomial):	❖ Occurs after 48 hours of hospital admission. ❖ Common agents: ○ Staphylococcus aureus (MSSA & MRSA, most common) ○ Pseudomonas aeruginosa & E. coli ○ Ventilator-associated pneumonia: Acinetobacter and Stenotrophomonas maltophilia.
Streptococcus pneumonia	❖ Most common cause of CAP and Lobar pneumonia ❖ More common in elderly, alcoholics, post-splenectomy,

Staphylococcal aureus	❖ Most common cause of pneumonia post influenza ❖ Most common cause of nosocomial pneumonia ❖ Association - intravenous drug users, or patients with underlying disease, e.g. leukaemia, lymphoma, cystic fibrosis (CF)
Klebsiella pneumonia	❖ Is rare. Also known as Friedlander pneumonia ❖ 5 A's of KlebsiellA: o Aspiration pneumonia (in Alcoholics and DiAbetics) o Abscess in lungs and liver o "Curr-A-nt jelly" sputum (blood/mucus)
Pseudomonas aeruginosa	❖ Green sputum ❖ Most common cause of nosocomial pneumonia ❖ Most common pathogen in bronchiectasis and CF ❖ Most common cause of death due to pneumonia in patients with cystic fibrosis
Mycoplasma pneumonia	❖ Cold agglutinins may cause an autoimmune hemolytic anemia, Guillain–Barré syndrome
H. Influenza	❖ Common in COPD, smokers ❖ Most common bacterial cause of acute exacerbation of COPD ❖ Most common organisms isolated from patients with bronchiectasis:
Pneumocystis jirovecii/ carinii	❖ Most common opportunistic infection in patients with acquired immunodeficiency syndrome (AIDS) ❖ Occurs when CD4+ cell count < 200/mm3

NOW LET'S PRACTICE SOME PAPER MCQ'S

LOBAR PNEUMONIA

- First histopathological stage of lobar pneumonia = Congestion and edema
- A patient with aspiration pneumonia develops chest pain with dullness on percussion in an area medial to the medial border of the scapula on elevation of the arm. Which part of the lung is most likely to be affected? = Right apical lobe
- The most reliable diagnostic test for lobar pneumonia is = Sputum culture for bacteria
    - It also comes as
        - The most accurate test for diagnosing typical lobar pneumonia (neutrophils more than 90) is = Sputum culture
        - For pneumonia diagnosis = Sputum culture

GENERAL PNEUMONIA

- 9 months' child presented with fever & cough. He was negative for Respiratory syncytial virus. Other common cause could be = Strep pneumonia
- Secretions in pneumonia are collected in = Alveoli

KLEBSIELLA PNEUMONIA

- Friedlander pneumonia caused by = Klebsiella pneumonia
- A diabetic patient with thick mucoid sputum jelly-like. Organism involved is = Klebsiella
- Current jelly sputum is characteristic feature of = Klebsiella pneumonia
- An elderly alcoholic man presented with fever persistent cough and thick mucoid sputum jelly like Organism most likely is = Klebsiella

STREPTOCOCCUS PNEUMONIA

- Patient suffering from lobar pneumonia causative organism = Streptococcus pneumonia
- Streptococcal pneumonia infection in a person, clearance of infection will occur via = H2O2

  - It also comes as
    - An old man is diagnosed to have lung parenchymal Strep Pneumoniae disease. This organism is eliminated from body using= Hydrogen peroxide
    - Streptococcus pneumoniae is primarily eliminated through the action of hydrogen peroxide (H_2O_2) produced by neutrophils and macrophages during the respiratory burst.
- The most potent toxin produced by Streptococcus pneumonia is = Streptolysin
- Strep pneumonia is a = Lancet-shaped Diplococci
  - It also comes as
    - A 60-year old patient presented with meningitis caused by streptococcus pneumonia. Gram staining will show = Diplococcus (Lancet shaped)
- A 70-year-old lady presented with fever, cough with yellow sputum, involvement of the lower lung lobes and was unable to recognize her family. The organism observed was gram +ve and catalase -ve. Most likely cause is = Strep pneumonia
  - It also comes as
    - A 70-year-old lady presented with fever, cough with yellow sputum, involvement of the lower lung lobes and was unable to recognize her family. Most likely cause is = Strep pneumonia
- Most common cause of otitis media in children is = Strep pneumonia
- Acute maxillary sinusitis is caused by = Strep pneumoniae

STAPHYLOCOCCUS AUREUS

- A child who had an episode of influenza pneumonia presented with a cough, thick yellow mucoid sputum along with cough. The most likely organism is = Staph Aureus
- Most common cause of hospital-acquired pneumonia = Staph. Aureus
- A man consumed food from a street vendor develops right hypochondriac pain. After 10 days in the hospital, he suddenly developed dyspnea with hemoptysis and streaks of blood. X-ray was done showing homogenous opacity with multiple air-fluid levels confirming lung abscess. What could have possibly caused the lung abscess? = Direct extension of infection via liver
- The most common bacterial agent to cause meningitis, secondary to pyogenic lung abscess is: = Staphylococci
- A Hospitalized patient developed multiple lung abscesses. The most common cause is = Staphylococcus Aureus
- The most common bacterial opportunistic organism = Staph aureus
- A 55-year-old presents with fever, SOB, and cough with thick yellow sputum. CXR shows an apical opacity with air fluid levels. The most likely organism involved is? = Staph aureus
- If Staphylococcus Aureus is inoculated into a lymphatic channel, what finding will be noted after 24 hours? = Antigen presenting cells at the site
- The commonest hospital-acquired organism causing infection is? = Staphylococcus Aureus
- Which organism is most commonly responsible for wound infection in hospital wards? = Staph Aureus
- A 60-year-old male diabetic was admitted with pneumonia. Sputum culture revealed growth of gram-negative rods. His blood sugar level was normal. On the 6th day, he developed a "shock-like" state. The most likely underlying cause for this condition is = Increased vascular permeability

MYCOPLASMA PNEUMONIA

- Atypical pneumonia feature is seen with = Mycoplasma
- Atypical pneumonia symptoms. X-ray showed bilateral diffuse infiltrates. What is most likely cause? = Mycoplasma
- Which of the following pathogens is associated with the development of cold hemolytic anemia? = Mycoplasma pneumonia
- Rickettsia and Mycoplasma are differentiated by? = Giemsa stain
- The bacterium resistant to β-lactam, causing fever and lethargy, is = Mycoplasma
- Regarding autoimmune hemolytic anemia by cold agglutinin, which one of the following organisms is responsible? = Mycoplasma

PSEUDOMONAS AERUGINOSA

- Man on vent has pneumonia, sputum showed greenish color. Diagnosis = Pseudomonas
- A child diagnosed with cystic fibrosis developed bronchiectasis, causative agent = Pseudomonas aeruginosa

PNEUMOCYSTIS PNEUMONIA

- Most common complication of AIDS = Pneumocystis carinii
- A kidney transplant patient developed severe pneumonia not responding to antibiotics. Broncho-alveolar lavage fluid showed boat-shaped cysts. The most likely cause of pneumonia in this case would be = Pneumocystis carinii (jirovecii)
- The most likely mechanism of the therapeutic effect of co-trimoxazole in a patient who is suffering from pneumocystis carinii pneumonia is inhibition of = Folic acid synthesis

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155. EXUDATIVE PLEURAL EFFUSION MAY OCCUR IN = BACTERIAL PNEUMONIA

REMEMBER:

Transudative Effusion	Exudative Effusion
❖ ↓ Protein Content	❖ ↑ Protein Content
❖ Causes o Mnemonic: **S**ome **P**ersistent **P**eople **C**an **C**ause **N**ausea ▪ **S**VC syndrome ▪ **P**eritoneal dialysis ▪ **P**ulmonary embolism ▪ **C**HF (>90% cases—most common) ▪ **C**irrhosis ▪ **N**ephrotic syndrome	❖ Causes: o Mnemonic: PICTURE MAP ▪ **P**arapneumonic effusion (associated with bacterial pneumonia, lung abscess) ▪ **I**nfections (viral, bacterial, fungal) ▪ **C**ancer ▪ **T**rauma/tumour (chylothorax) ▪ **U**remia ▪ **R**ickettsial infection ▪ **E**sophageal perforation ▪ **M**eigs syndrome (ascites +hydrothorax associated with ovarian tumor) ▪ **A**sbestos ▪ **P**ancreatic disease (elevated pleural fluid amylase)

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

EXUDATE FEATURES AND DIAGNOSIS

- Following is true about exudate = Protein > 3.5 gram
    - It also comes as
        - Pt with parapneumonic effusion. Lab finding of the effusion will be = Protein 3.5g/dL
        - Lobar pneumonia leading to parapneumonic effusion. What finding will be seen in the pleural fluid = Proteins more than 3.5gm
- Fluid from a pericardial tap with a protein content of more than 3.0 g/dl is described as = Exudate
- Gonococcus is easily identified in exudate specimen by? = Gram staining
    - It also comes as
        - The easiest method to demonstrate gonococci in the exudate is = Gram's stain of the exudate
- Which of the following is the most important factor in the formation of (inflammatory) exudate? = Increased permeability of vessels
- The main characteristic of exudate is = Inflammatory cells
- An old man of 70 years had worsening shortness of breath for one week. The term that describes the process best, occurring in the pleural cavity is = Purulent exudate

- A man presents with hx of cough with no fever. A sample of pleural fluid was taken and sent to R/E, the report showed cloudy yellow color fluid containing 98% neutrophil and 1% lymphocytes. O/E dull percussion and absent breath sounds on the fluid side. What is the most likely diagnosis = Purulent effusion
  - It also comes as
    - Patient with cloudy pleural fluid containing 98% neutrophils and dull percussion, most likely diagnosis = Purulent effusion

TRANSUDATE FEATURES AND DIAGNOSIS

- The characteristic feature of transudate is = Hypocellularity
- A patient known case of CHF, with pleural effusion. How will you say the fluid is transudate = Low specific gravity
- An 80-year-old male cardiac patient has SOB and progressively developing orthopnea and presented with pleural effusion for which tap was done. Which factor is suggestive of transudate = Low cell count
- Young man with heart failure, B/L pleural effusion. In pleural tap, what will you see to consider it as transudate fluid secondary to heart failure = 2-3% lymphocyte

ASSOCIATED CONDITIONS

- Pelvic mass, ascites, pleural effusion, diagnosis = Meigs syndrome
  - It also comes as
    - The most likely diagnosis in a woman with pelvic mass, ascites, and pleural effusion = Meig's syndrome
- Blockage of thoracic duct causes = Chylopericardium
- A man presented with pitting edema, urinary albumin 2+ and bilateral pleural effusion. The cause is = Hypoalbuminemia
- A 56-year-old man has had increasing difficulty breathing for the past week. On physical examination, he is afebrile. Auscultation of the chest reveals diminished breath sounds and dullness to percussion bilaterally. There is 2+ pitting edema present to the level of the thighs. A chest radiograph reveals bilateral pleural effusions. Which of the following laboratory test findings is he most likely to have? = Hypoalbuminemia
  - It also comes as
    - A patient presents with difficulty breathing for some days. O/E breath sounds are decreased bilaterally with dullness on percussion, and X-ray shows bilateral pleural fluids. The most likely cause is = Hypoalbuminemia
- Which of the following is given to patients with CCF and pleural effusion = Loop diuretics
- A 31-year-old woman has noted chest pain for the past week. On examination, she has decreased breath sounds with dullness to percussion at lung bases. A chest radiograph shows modest bilateral pleural effusions. On chest CT scan, the pleural effusions, as well as a pericardial effusion, are seen. A thoracentesis on the left yields clear fluid with a low protein and cell count. She is found to have an anti-double stranded DNA titer of 1:512. Which of the following pathologic processes caused these effects = Glomerular immune deposits
- Pleural fluid commonly gravitates down to = The costodiaphragmatic recess
  - It is also asked as
    - A patient is examined in the standing position with left-sided pleurisy. The pleural fluid commonly gravitates down to: = the costodiaphragmatic recess.

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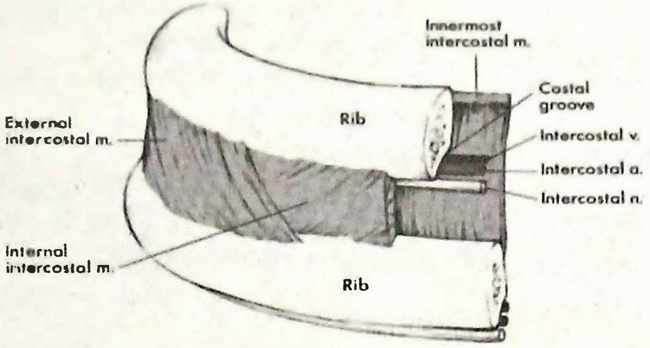
156. A KNOWN CASE TUBERCULOSIS PRESENT WITH LEFT-SIDED MASSIVE PLEURAL EFFUSION. WHAT IS THE MOST APPROPRIATE SITE FOR THORACENTESIS = LOWER BORDER OF 9TH INTERCOSTAL SPACE IN MID AXILLARY LINE

KNOW THIS BEST SITE FOR NEEDLE OR TUBE INSERTION IN INTERCOSTAL SPACE



- Vessel's arrangement: Form above downwards – (VAN) --- Vein, Artery then Nerve
- The needle or tube should be inserted at the upper border of the rib.
- This corresponds to the lower border of the intercostal space, as the rib's upper border forms the safe area for access.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- First structure to be traumatized under rib when passing chest drain= Intercostal nerve
    - It also comes as
        - During thoracentesis at the 9th intercostal space, the likely damaged structure is= 9th intercostal nerve
        - A student inserted a needle in thoracic cavity for pleural tap at lower margin of rib. Which of the following will most likely be damaged? = Nerve
- The structure not pierced when passing a needle into the pleural cavity in the mid-axillary line is = Levator costarum
- Neurovascular bundle is present in= Beneath lower border of upper rib
- Where is the recommended location for pleurocentesis= 9th intercostal space midaxillary line
    - It also comes as
        - A known case tuberculosis present with left-sided massive pleural effusion. What is the most appropriate site for thoracentesis? = Lower border of 9th intercostal space in mid axillary line

KNOW THE DIFFERENCE

- Best site for pleural effusion for tap is = Lower border of intercostal space in mid axillary line
- Pericardiocentesis is best achieved by passing a needle through= The subcostal angle
    - It is also asked as
        - patient presents with shortness of breath and a scratchy sound, which does not change with respiration. Echocardiography reveals pericardial effusion. What is the best site for fluid removal= Subcostal with needle angled superiorly

- A known case tuberculosis present with left-sided massive pleural effusion. What is the most appropriate site for thoracentesis? = Lower border of 9th intercostal space in mid axillary line
- While doing thoracocentesis, it is advisable to introduce needle along= Upper border of the rib

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157. COPD PATIENT, O2 PRESSURE AT 10CM OF WATER BY PEEP FOR 24 HRS WOULD CAUSE= PNEUMOTHORAX

ABOUT PNEUMOTHORAX

Primary Spontaneous	❖ Due to rupture of apical blebs or cysts. Occurs most frequently in tall, thin, young males.
Secondary Spontaneous	❖ Due to diseased lung (e.g., bullae in emphysema,

	infections), mechanical ventilation with use of high pressures →barotrauma.
Traumatic Pneumothorax	❖ Caused by blunt (e.g. rib fracture) or penetrating (e.g., gunshot) trauma
Tension Pneumothorax	❖ Can be any of the above. ❖ Air enters pleural space but cannot exit. ❖ Increasing trapped air → tension pneumothorax. ❖ Trachea deviates away from affected lung

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- A patient with shortness of breath, trachea shifted to the left side, absent breath sounds on the right side of the chest, and hyper-resonant percussion note on the right side. Diagnosis? = Pneumothorax
- A patient with trachea deviated to the right side and a gush of air after thoracentesis has = Tension pneumothorax
- There is the greatest chance of pneumothorax formation while inserting CVP via which route = Right subclavian
- A man given hyperbaric oxygen for 24 hours develops dyspnea and goes into respiratory distress. Most likely cause is = Spontaneous pneumothorax
- A patient came to ER with shortness of breath and sharp chest pain. O/E no air entry on right side and hyper-resonant on percussion. The lungs collapsed inward and chest sprung outward. CXR shows trachea shifted towards left. Diagnosis is = Right sided pneumothorax

MECHANISM AND EFFECTS OF PNEUMOTHORAX

- The finding of pleura ruptured in pneumothorax is = Inward lung collapse and outward chest wall spring
- If a person suffered a stab injury and air entered in the intrapleural space (pneumothorax), the most likely response for the lung would be = To collapse inward and the chest wall to spring outward
- A 20-year-old male was riding a bicycle and had a road traffic accident. He fell on the ground and the brake lever of his cycle penetrated his chest wall on the right side, subsequently developing severe shortness of breath. X-ray chest revealed 55% pneumothorax of the right lung due to rupture of the pleural cavity. The most likely effect would be = The intrapleural pressure in the affected area is equal to atmospheric pressure
    - It also comes as
        - Regarding right-sided pneumothorax = Atmospheric and pleural pressure become equal

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158. A 30 YEARS OLD MAN HAD A ROAD TRAFFIC ACCIDENT AND SUSTAINED FRACTURE OF FEMUR. TWO DAYS LATER HE DEVELOPED SUDDEN BREATHLESSNESS. THE MOST PROBABLE CAUSE CAN BE = FAT EMBOLISM

REMEMBER

Pulmonary Emboli	❖ Important cause of sudden death, usually occurring in immobilized postoperative patients and in those with CHF. ❖ Immobilization leads to venous thrombosis in the lower extremities. ❖ Thrombus break away and travel to pulmonary artery. ❖ Treat with hyperbaric O_2
Arterial Emboli	❖ Arterial emboli usually arise from a mural thrombus (thrombus that adheres to one heart chamber or major artery). ❖ Example: Branches of the carotid artery, most frequently the middle cerebral artery, leading to cerebral infarction
Fat Emboli	❖ These are particles of bone marrow and other fatty tissue as a result of severe fractures
Air Emboli	❖ Due to air entering into circulation as seen in penetrating chest injury or criminal abortion.

	❖ Also seen in deep-sea divers (decompression sickness) who return to the surface too rapidly.
Amniotic Fluid Emboli	❖ These emboli are caused by escape of amniotic fluid into the maternal circulation. ❖ They can activate the coagulation process, leading to DIC.

- Easily they could be remembered as
  - SOB after fracture= Fat embolism
  - SOB in deep sea divers, chest injury= air embolism
  - SOB in pregnant ladies, during labor and postpartum = amniotic fluid embolism
  - SOB on lying down= retrosternal goiter.

NOW LET'S DISCUSS SOME PAPER MCQ'S

FAT EMBOLISM

- True regarding fat embolism is = Mostly due to fracture of long bones
- A 30-year-old man had road traffic accident and sustained fracture of femur. Two days later he developed sudden breathlessness. The most probable cause is = Fat embolism
  - It also comes as
    - A 38-year-old man got pelvic fracture in RTA. He loses 2L of blood in accident. After 5 days he died, and his brain CT scan shows multiple areas of infarction. What is the cause of his death = Fat embolism
    - An elderly man died 4 days after a road traffic accident (RTA) and was found to have a femur fracture. Upon autopsy, pulmonary infarcts were present, and the vessels were occluded by cells of hematopoietic stem cell origin. What is the most likely cause of death in this case= Fat embolism
    - Cause of death 4-5 days after a long bone fracture = Marrow embolism
- Which stain is used to see fat granules in fat embolism on autopsy= Sudan stain
  - Sudan stains (e.g., Sudan III, Sudan IV, or Sudan Black) are used to stain fat granules and lipids.
  - Other option was Frozen fat stain-----While frozen sections are used for fat tissue, Sudan stains are specifically used to detect fat.

AMNIOTIC FLUID EMBOLISM

- Patient after prolonged labor developed SOB and died. Diagnosis is = Amniotic embolism
  - Note-----Amniotic fluid embolism can occur in During prolong labor, delivery or postpartum
  - It also comes as
    - 40 weeks pregnant in 25 hrs prolonged labor presents with dyspnea, tachypnea but dies. Cause of her death is = Amniotic embolism
    - SOB in pregnant ladies, during labor and postpartum = Amniotic fluid embolism
    - A pregnant lady with labor pains and obstructed labor was taken to the hospital but died before reaching to the hospital. Most likely cause is = Amniotic fluid embolism
    - A 25-year-old full-term pregnant female living in a village went into obstructive labor. She was taken to a hospital 50 miles away. On arrival at the hospital, she collapsed and died. The most likely cause of death would be = Amniotic fluid embolism
    - A 25-year-old full-term pregnant woman who collapsed and died after obstructive labor most likely died from = Amniotic fluid embolism

PULMONARY EMBOLISM: CAUSES AND MECHANISM

- The worst complication of venous thrombosis is = Pulmonary embolism
- Pulmonary embolism is most likely caused by = Thrombosis in deep veins of the leg
- The most common cause of pulmonary embolism is an embolus from = Femoral vein
  - It also comes with different options
    - In a case of massive pulmonary thromboembolism, most common site from where emboli originate is = Popliteal veins

- Complication most likely to occur after leg swelling and tenderness 2 weeks post-femur fracture = Pulmonary thromboembolism
- Deep vein thrombosis first gets lodged in = Pulmonary artery and branches
- Hemorrhagic infarction occurs in = Thromboembolism in lungs
- Pulmonary embolism typically involves = Medium-size artery
  - It also comes as
    - Pulmonary infarction most likely results from = Pulmonary embolism involving a medium-size artery
    - 55-year male developed respiratory problem after abdominal surgery. Diagnoses of pulmonary infarction made on the basis of subsequent investigation. This infarction is most likely to result from= Pulmonary embolism involving medium size artery
- A young male operated for cholecystectomy. Three days after surgery, he developed dyspnea, chest pain and cyanosis. What is the probable diagnosis = Pulmonary embolism
  - It also comes as
    - A non-insulin-dependent diabetic woman develops dyspnea, chest pain, and cyanosis 3 days post-cholecystectomy, likely diagnosis = Pulmonary embolism
    - A diabetic lady operated for cholecystectomy comes 8 days after surgery and has developed dyspnea, sudden chest pain, hemoptysis and cyanosis. What is the probable diagnosis = Pulmonary embolism
- A 45-year-old female was on prolonged bed rest and now she is having shortness of breath and peripheral edema. Her chest X-ray shows many areas of infarction. The cause is = Recurrent pulmonary embolism
  - It also comes as
    - A patient with shortness of breath and peripheral edema after prolonged bed rest, with chest X-ray showing many areas of infarction, is most likely due to = Recurrent pulmonary embolism
    - For the past 5 months, a 51-year-old woman has noted increased swelling of her lower legs as the day progresses. Which of the following underlying diseases is most likely to cause these findings? = Recurrent thromboembolism
    - A 55-year-old female known case of hematological disease, admitted to the hospital with the history of sudden onset of severe dyspnea along with B/L pedal edema, ascites with features of nutmeg liver. CXR shows pulmonary edema and enlarged right heart shadow. What could be the best possible cause associated with her condition = Repeated pulmonary embolism (thromboembolism)
- A shopkeeper suddenly collapsed with thin and thready pulse. O/E his BP was 80/40, cold clammy skin and gives history of sudden crushing chest pain before collapse. Diagnosis = Massive Pulmonary Embolism
- Most fatal type of pulmonary embolism that causes extensive pulmonary necrosis, shock and then death=Thromboembolism
- A female patient immobilized for the past 6 weeks develops shortness of breath. She gives history of recent MI. A triangular shaped hemorrhage was seen in lungs. Which of the following conditions is most likely the cause= Thromboembolism
- Patient having a history of hematological disorder for which he remained admitted in hospital for a long period. Now he suddenly developed dyspnea. Echo reveals pulmonary hypertension. What will be the most probable cause = Repeated previous pulmonary emboli
- A 55-year-old lady with swelling of both legs and B/L pleural effusion presents to you. Lab values = AST 263, ALT 223, LDH 760, CK 150. No fever or other symptoms. Diagnosis = Recurrent thromboembolism
  - Remember this BCQ is taken from USMLE review notes---Pulmonary hypertension and subsequent right heart failure can occur in the small number of cases in which recurrent thromboembolism takes place. The right heart failure that occurs then leads to hepatic passive congestion with centrilobular necrosis that is the cause for the increased transaminases and LDH (but normal CK, since the heart is enlarged, but not ischemic

EMBOLISM IN OTHER SYSTEMS

- A 55-year-old man known IHD patient with recent history of AF presents with sudden unconsciousness. He is suspected to have a stroke due to occlusion of cerebral artery. The most likely cause is = Embolism
- The most likely cause of stroke in patients with atrial fibrillation is = Embolism
- A patient was diagnosed to have a pale infarct. In which of the following conditions does it occur = Embolic/ischemic stroke
- A 50-year-old man who has previous history of diabetic retinopathy and MI presented with severe chest pain and sweating. Coronary occlusion occurs commonly due to = Embolism
- A patient developed atrial fibrillation, he was treated accordingly, but the same patient died due to occlusion of vessels in brain. Cause of death is = Embolism
- A 35-year-old man otherwise healthy presented with sudden, painless loss of vision due to occlusion of central retinal artery. The most likely cause is = Embolism

ALSO NOTE THESE

- Volume of air needed to cause air embolism= 100cc
- A 20-year male with dyspnea on lying down, the anatomical structure likely to cause this dyspnea is=Retrosternal goitre
- The most common feature of Pulmonary embolism= Clinically silent
- Capnometer is used to measure pCO2. What else can it be used for=Useful in air embolism

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159. A 30 WEEKS' PREGNANT LADY ENCOUNTERED FRACTURE OF FEMUR IN RTA, DIED AFTER 5 DAYS. MOST LIKELY CAUSE OF HER DEATH IS= FAT EMBOLISM

- As discussed above here are two scenarios---she is pregnant so she could have amniotic fluid embolism, but she also has fracture which could cause Fat embolism as well ----so what to choose in such options:
- Remember for such MCQs, time would be given and that is the trick---- amniotic fluid embolism can occur suddenly, while fat embolism takes more than 12-72 hours.
- This rule to be applied only when fracture and labour both given in scenario at the same time

NOW LET'S DISCUSS SOME PAPER MCQ'S

- True regarding fat embolism is = Symptoms appear after 12 hours
- A pregnant lady in her 3rd trimester was severely injured in RTA with left side of femoral head fracture and dies on her way to ER. Cause of her sudden death is= Amniotic fluid embolism
- A pregnant lady with pains of obstructed labor was taken to hospital for C-section but dies on the way before reaching the hospital. Cause is= Amniotic fluid embolism
    - Note the difference
        - 23 weeks' pregnant women died in RTA. Type of death= fortuitous death
- A 30 weeks pregnant female has shortness of breath she died after 5 days, cause= pulmonary embolism
    - If death due to shortness of breath in a pregnant lady without mentioning During prolong labor or obstructed labour, delivery, postpartum, fracture then as pregnancy is hypercoagulable state inc chances of DVT so select pulmonary embolism then
- A young male had an RTA which resulted in a femur fracture. He died 5 days' later autopsy showed cerebral petechiae. Diagnosis= Fat embolism
- After 5 days of femur fracture, patient died as a result of= fat embolism

ALSO REMEMBER

- A 45 yr male presented to ER with fracture of pelvic bone in RTA with shock. Most likely cause of shock is= Excessive blood loss

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160. MOST COMMON CAUSE OF PULMONARY EMBOLISM IS= IMMOBILIZATION

REMEMBER THIS ABOUT HYPERCOAGULABLE STATES

- ✓ Most common cause of venous thrombosis=Prolonged immobilization
- ✓ Most common **#acquired** thrombotic disorder / Recurrent abortions= Anti-phospholipid Syndrome
- ✓ While most common **#inherited** thrombotic disorder is =factor V leiden
- ✓ Most devastating effect of OCP= Thromboembolism

Also note the other causes are

- ✓ Atrial fibrillation, cardiomyopathy, cancer

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ Female taking OCP are most likely to develop which of the following due to OCP use = Pulmonary embolism
  - o It also comes as
    - ▪ A female is taking HRT and has risk of developing= thromboembolism
    - ▪ Prolonged exposure to estrogen increases risk for = Thromboembolism
    - ▪ The use of estrogen-containing oral contraceptives increases the risk of = Thromboembolism
    - ▪ A postmenopausal woman is on HRT for postmenopausal related osteoporosis. What complication is she at risk of = Thromboembolism
    - ▪ A female taking estrogen therapy to relieve post-menopausal symptoms will likely have increased risk of = Thromboembolism
    - ▪ female taking OCP's, which one of the following is the most common side effect= Thromboembolism (few recalled as DVT)
    - ▪ Long-term use of estrogen increases the risk of one of the following diseases = Deep vein thrombosis
- ❖ Absolute contraindication of OCP is = Recent Hx of stroke
- ❖ Which of the following is most likely to be genetic cause of thromboembolism= Homocystinuria
  - o We know from above points the most common genetic/inherited cause so don't be confused
  - o Homocystinuria is also a genetic cause but a very rare one
- ❖ Most common acquired deficiency causing thrombosis is = Antiphospholipid antibody syndrome
- ❖ A young married female presented with a history of recurrent abortions and deep vein thrombosis. On investigation, she had a prolonged APTT which could not be corrected with normal plasma. The most likely diagnosis is: = Antiphospholipid syndrome

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161. MOST COMMON CAUSE OF VENOUS THROMBOSIS (DVT)=PROLONGED IMMOBILIZATION

REMEMBER THESE MCQS ABOUT THROMBOSIS AND DVT

DEEP VEIN THROMBOSIS (DVT)

- ❖ The most common complication of DVT is=Emboli
- ❖ Pulmonary embolism occurs mostly by= DVT
- ❖ In DVT, the emboli first get lodged into which of the following = Pulmonary artery
  - o It is also asked as
    - ▪ Deep vein thrombosis (DVT) first gets lodged in = Pulmonary artery and branches
- ❖ Most common cause of venous thrombosis (DVT) = Prolonged immobilization
  - o It is also asked as
    - ▪ Deep venous thrombosis is seen in = Prolonged immobilization
    - ▪ A 35-year-old pregnant woman on bed rest suddenly developed painful swelling of the right leg. The most likely cause will be = Deep venous thrombosis
    - ▪ A pregnant woman was advised bed rest after which she developed painful swelling in the right leg. The most likely cause would be = DVT
- ❖ The pathogenesis of venous thrombosis in a 60-year-old female's leg vein after a major abdominal operation is most likely due to = Stasis and hypercoagulable state

- It is also asked as
    - A 60-year-old male developed pain in the left lower leg 5 days after a major abdominal surgical procedure. The pathogenesis of his symptoms is best explained by venous thrombosis due to = Stasis & Hypercoagulable state
    - A woman develops DVT after laparotomy. Most likely cause is = Stasis + Hypercoagulable state
- A 32-year-old G4 para 2 admitted in antenatal ward at 32 weeks. History of right leg swelling for three days. Doppler studies confirmed DVT. What is the most important factor responsible for thromboembolic disease = Venous stasis
- Regarding superficial venous thrombosis, which is true = Mostly in saphenous venous system
- A 60-year-old male patient residing at 12000 feet has a previous history of myocardial infarction. Now presented with bilateral lower limb swelling with bluish appearance. His Hb is 14 g/dl. The most likely cause of his symptoms is = Venous thrombosis
- Phlebo-thrombosis is found in the = Venous system

THROMBOSIS: PATHOGENESIS AND CAUSES

- What is the most important factor in the pathogenesis of thrombosis = Endothelial injury
    - It is also asked as
        - The most important factor for coagulation to begin is = Rough endothelial surface
- Most common cause of infarction (ischemia) in an organ is = Thrombosis
- A 50-year-old man who has previous history of diabetic retinopathy and MI presented with chest pain. Coronary occlusion occurs commonly due to = Thrombosis
- A man presented with headache, furuncle on tip of nose, high fever with redness and swelling of eye and increased ICP. Diagnosis = Cavernous sinus thrombosis
- Which findings are suggestive of bad prognosis in acute renal transplant rejection = Vasculitis and thrombosis
- In acute renal transplant rejection, the most common histological finding suggesting bad prognosis would be = Vasculitis and thrombosis
- A 50-year-old man with previous history of diabetic retinopathy & MI presented with chest pain. Coronary occlusion occurs commonly due to = Thrombosis
- The most suitable thrombolytic agent used in coronary thrombosis is = Streptokinase

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162. GAS HAVING MAXIMUM DIFFUSION CAPACITY IN BODY FLUIDS = CO2

163. WHICH OF FOLLOWING HAS MAXIMUM DIFFUSION CAPACITY THROUGH PULMONARY MEMBRANE AND TISSUES= CO2

Note that.

- Max affinity= CO
- Max diffusion=CO2

Also remember.

- Glucose transport through placenta via = facilitated diffusion
- Taut hemoglobin or T-state hemoglobin has reduced affinity for= O2
- The diffusion capacity of pulmonary capillary increases in? = Polycythemia
- Thermal diffusion capacity = Transfer of amount of heat

---

164. MOST COMMON CANCER REGARDLESS OF GENDER? = LUNG CANCER

ABOUT LUNG CANCERS

- Leading cause of cancer death
- Risk Factors: Smoking, passive smoke, radon, asbestos, family history, EGFR mutations (non-smokers, adenocarcinoma).
- Presentation: Cough, hemoptysis, wheezing, bronchial obstruction, coin lesion on CXR or non-calcified nodule on CT.

- Complications:
  - Superior Vena Cava Syndrome: Facial swelling, cyanosis, venous dilation.
  - Pancoast Tumor:
    - Apex involvement → Horner syndrome (ptosis, miosis, anhidrosis).
    - Causes SVC syndrome, hoarseness (RLN compression).
  - Paraneoplastic Syndromes

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Pancoast tumor mainly seen in case of =squamous cell carcinoma
- Horner's syndrome is caused by= Pancoast tumor
- A 55-years old known diabetic and smoker was found to have smaller pupil with partial ptosis on right side. The most likely diagnosis is = Horner's syndrome
- Interruption to cervical sympathetic chain results in Horner's syndrome, if nerves to the eye are affected. Which one of the following is the commonest finding= drooping of the eyelids on affected side
- Most likely primary site for metastatic lung cancer with histology of sheets of clear cells is = Kidney
- A 45-year-old healthy woman has a routine check of her health status. She has no chest pain, cough, or fever. A chest x-ray was taken and showed a peripheral 2.5 cm diameter "coin lesion" in the right mid-lung field. Which of the following biologic characteristics best distinguishes this lesion as a neoplasm, rather than a granuloma= Uncontrolled (autonomous) growth

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165. ECTOPIC THYROID HORMONE IS PRODUCED BY = SQUAMOUS CELL CARCINOMA OF LARYNX

PARANEOPLASTIC SYNDROMES:

- Small cell carcinoma: ACTH (Cushing), SIADH, Lambert-Eaton syndrome.
- Squamous cell carcinoma: PTH-like activity → hypercalcemia.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Smoking is most commonly related to = Squamous cell carcinoma of the lung.
- At autopsy, a 60-year-old man is found to have a peripheral 7 cm area of golden-yellow consolidation on sectioning of the left lung. Microscopically, this area has alveoli filled with foamy macrophages. Which of the following conditions in his lung is most likely to be responsible for this finding? = squamous cell carcinoma.
- A 55-year-old man has been a cigarette smoker for the past 40 years. He has noted some blood-streaked sputum on coughing during the past week. He also has back pain. A chest radiograph shows a small 3 cm right hilar mass with several 1 to 2 cm peripheral lung nodules. A bone scan reveals multiple areas of increased uptake in the vertebrae, ribs, and pelvis. A sputum cytology reveals the presence of clusters of small cells having hyperchromatic nuclei and almost no cytoplasm. Which of the following laboratory test findings is he most likely to have as a consequence of his lung disease? = serum sodium of 113 mmol/L.
- Para-neoplastic syndrome is exhibited by one of the following tumours = Small cell carcinoma lung
- Which of the following is associated with paraneoplastic syndrome = Small cell Ca of lung
- A 60-year-old man with a 90 packs per year history of smoking, experiences an episode of hemoptysis. On physical examination he has puffiness of the face, some pedal edema, bruising of the skin and BP of 165/100 mmHg. A chest radiograph reveals a 5 cm right upper lobe lung mass. A fine needle aspirate of this mass yields cells consistent with small cell anaplastic ("oat cell") carcinoma. A bone scan shows no metastases. Immunohistochemical staining of the tumor cells is likely to be positive for= ACTH
- A 30-year-old female with small cell lung cancer presented with excess hair growth, hypertension, hyperpigmentation, and a cushingoid appearance. The marker raised is = ACTH
- Lung carcinoma most often associated with hormone-like substance production is = Small cell anaplastic (oat cell carcinoma)
- Small cell lung carcinoma is likely to be positive for = ACTH

NEPHROLOGY

166. **A MAN HAS LOST 2L WATER BY SWEATING AND REPLACED BY 2L PURE WATER. WHAT WILL HAPPEN= DECREASE ICF OSMOLARITY**

REMEMBER

- ✓ Total body water is 60% of body weight, 2/3rd (40%) of it is Intracellular, while 1/3rd (20%) is extracellular
    - o It can simple be remember **as 60-40-20** rule
        - ▪ TBW is **60%** of body weight, ICF is **40%** of body weight., ECF is **20%** of body weight
- ✓ So, by doing simple math's
    - o Total body water in litres in a 70kg person is → 70 × 0.6 = 42 L

ICF	ECF
ICF will be 28L	While ECF 14L--- ❖ Further divided into o Plasma: ▪ 1/4th of ECF o Interstitial fluid: ▪ 3/4th of ECF
Major cations k+ and Mg+ Mnemonic:HIKIN (HI ghK IN side)	Major cations Na+ Major anions: Cl- and HCO3-

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

TOTAL BODY WATER AND COMPARTMENTS

- ❖ Total volume of ICF in 70kg adult man = 28 Liters
- ❖ A 60-year male weighing 70 kg has total body water of 42L (60% of body weight). How much of this will be present in interstitial fluid=11.5L
    - o Total body water is 42L---so it means ICF (40%) is 28L—so ECF is 14L
    - o Now ECF is composed of 3.5L of plasma volume and remainder is interstial fluid
- ❖ One of the following fluid compartments contains approximately two-thirds of the total body water = Intracellular
    - o It also comes as
        - ▪ About 2/3rd of body fluid is = ICF
        - ▪ Total body water contains = 2/3 ICF
- ❖ About one third of total body water is = Extracellular fluid
- ❖ Plasma volume is approximately what percentage of the extracellular volume= 20 % (20-25%)
- ❖ If 600 ml of water is drunk rapidly, then the plasma volume will increase approximately by? = 50 ml
    - o Total water intake = 600 mL
    - o Distributed into compartments:
        - ▪ 2/3 to ICF = 600×2/3 = 400 mL
        - ▪ 1/3 to ECF = 600×1/3 = 200 mL
    - o Within ECF:
        - ▪ Interstitial Fluid (3/4 of ECF): 200×3/4=150 mL
        - ▪ Plasma (1/4 of ECF): 200×1/4=50 mL

DIFFERENCES BETWEEN ICF AND ECF

- ❖ ECF is different from ICF in = Inorganic anions

- ICF differs from ECF in = Increased K+
    - It is also asked as
        - Compared with intracellular fluid, extracellular fluid has = A lower potassium ion concentration
        - An ion which has a higher concentration in intracellular fluid than in extracellular fluid is = K+
- Difference between intracellular fluid and extracellular fluid is = Decreased pH of intracellular fluid
    - It is also asked as
        - The intracellular fluid (ICF) differs from the extracellular fluid (ECF) in having = Lower pH
- Extracellular fluid differs from the intracellular fluid in that it = Contains high Na+ and high Ca++ concentration
- Difference between plasma volume and interstitial fluid is = Protein
- Regarding K+ = 98% intracellular
- Cation present in higher concentration in ECF = Sodium
- Predominant cation of plasma is Na+ and it is balanced mostly by = Cl-
- Which electrolyte abnormality in ECF has a profound effect on the heart = Potassium
- The percentage of plasma in ECF is = 30%
- Which drug is most commonly distributed in the ECF = Mannitol
- In shock, what is given to compensate for lost ECF volume = IV Sodium
- A young man of 30 year working in intense heat had profuse sweating resulting in severe dehydration. The electrolyte having a fundamental role in immediate compensation for loss of his extra-cellular fluid is= Sodium

ALSO NOTE THESE

- By increasing the specific gravity of urine which kidney function is being assessed = Urine concentration
- Tears composition differ from plasma in = Tears have more amino acids
- The most prominent deficiency in lacrimal secretion when compared to plasma is = Glucose

---

167. THE SUBSTANCE USED TO MEASURE TOTAL BODY WATER IS= ANTIPYRENE

THIS MCQ ALWAYS COMES WITH DIFFERENT OPTIONS SO REMEMBER.

- TBW: ----- Tritiated H2O, D2O, Antipyrene
- ECF: ----- Sulfate, Inulin, Mannitol
- Plasma (1/4 of ECF): ------- RISA (radioiodinated serum albumin), Evans Blue
- Interstitial (3/4 of ECF): -------ECF - Plasma Volume
- ICF: ------ TBW – ECF

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Total body water can be calculated by= tritium
- Marker used to measure total body water=heavy water
- Total body water can be calculated by = Antipyrine
- The substance used to measure total body water is = Tritiated H2O
- Interstitial fluid can be measured by = Evan blue and Antipyrene

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168. A PATIENT PRESENTED WITH SEVERE DIARRHEA. WHAT INFUSION WILL BE GIVEN TO INCREASE HIS ECF AND DECREASE ICF CAUSING PLASMA EXPANSION AFTER OSMOTIC EQUILIBRIUM=1 LITER OF 3% NACL SOLUTION

REMEMBER ABOUT FLUIDS

- Crystalloid Solutions Overview
    - Hypertonic: 3% NaCl
    - Hypotonic: ½ Normal Saline (0.45% NaCl)
    - Isotonic: Normal Saline (0.9% NaCl), Ringer's Lactate, 5% Dextrose (D5W)

    - Remember 5% Dextrose starts as isotonic but acts as hypotonic in the body

- Fluid of Choice
  - Primary dehydration: 5% Dextrose
  - Severe dehydration: 5% Dextrose
  - Secondary dehydration: Ringer's Lactate
  - Free water clearance dehydration: 5% Dextrose
  - Pure water depletion: 5% Dextrose
  - Total water depletion: Hypotonic solutions (e.g., 0.45% saline or 5% dextrose)
  - Paradoxical aciduria = Darrow's solution > normal saline 0.9%
  - 3rd space fluid loss = Ringer lactate

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

Fluid of Choice

- Primary dehydration. Fluid of choice = 5% Dextrose
  - Also asked as
    - Severe dehydration. Fluid of choice = 5% Dextrose
    - Fluid given in secondary dehydration= Ringer's Lactate
- Which fluid that is given in primary dehydration, initially decreases ICF and increases ECF and increases total body water? = 3% Normal Saline
  - It also comes as
    - Patient with diarrhea: Which fluid should be given to increase ECF and decrease ICF= 3% Normal Saline
- Total water depletion replaced by = Hypotonic
  - It also comes as
    - What replaces pure water loss= 5% Dextrose
    - Total water depletion: How is it replaced= hypotonic solution (like 0.45% saline or 5% dextrose)
    - In pure water depletion, the fluid to be administered intravenously is = 5% Dextrose
- Dehydration of free water clearance. Fluid should be given = 5% Dextrose
- 15-20% blood loss. What fluid should be given? = Ringer Lactate
  - Remember
    - Up to 30% blood loss--- crystalloid (Ringer lactate > Normal saline)
    - More than 30% blood loss--- Blood + Crystalloid
  - It also comes as
    - Hypovolemia due to blood loss. To replace the fluid of intravascular compartment fluid given should be = Ringer lactate
    - Initial fluid given due to hypovolemic shock in trauma = Ringer Lactate
- Which fluid should be given in dehydration to acclimatized person= Ringer lactate
- Fluid of choice in paradoxical aciduria = Darrow's solution (if not present prefer normal saline 0.9%)
- 3rd space fluid loss. Fluid of choice = Ringer lactate

Effects of Dehydration and Fluid

- Solution which maximally increases ECF volume = Hypertonic saline
  - It also comes as
    - The largest increase in extracellular fluid is by the intravenous infusion of one litre of = Hypertonic NaCl
- In primary dehydration, which of the following occurs = Hypertonic ECF
  - It also comes as
    - In primary dehydration, the ECF becomes = Hypertonic
- A young man of 30 years working in intense heat had profuse sweating resulting in severe dehydration. The electrolyte having a fundamental role in immediate compensation for loss of his extracellular fluid is = Sodium

- It is also asked as
    - In a person with dehydration, which ion from ECF immediately helps in compensation = Na
- Ingestion of a meal containing 140 mEq of NaCl per 100 ml of water results in = An increase in osmolarity of both the ICF and the ECF

169. A PERSON LOSES 2L OF SWEAT WHILE WORKING AND HE DRINKS 2L OF PURE WATER. WHAT CHANGE WILL OCCUR IN BODY

NOTE THIS HIGHLY REPEATED MCQ-- ALWAYS WITH DIFFERENT OPTIONS

- Remember the sequence------ increase ICF volume > dec ICF osmolarity> inc ECF volume

ALSO NOTES THESE MCQS

- RBC swell up when placed in= 250 mmol Urea
- An RBC is kept in a hypertonic solution to which urea is added. What will be the effect on RBC= Swell, shrink and lyse
- Which of the following is almost equal to Plasma osmolality? = 0.9% Normal Saline
- Which of the following ions is the main determinant of plasma osmolarity? = Sodium
- A 50-year-old diabetic patient was presented to ER with DKA since he missed his insulin dose. Labs showed raised blood glucose, raised potassium, and deranged RFTs (increased). The likely approach in his management should be = Insulin with saline

170. WHICH IS MORE IN DIALYZING FLUID AS COMPARED TO PLASMA = GLUCOSE

NOTE THIS

- Dialysate Composition: Glucose and bicarbonates ↑, while Rest ↓

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- A patient suffering from end stage renal disease was advised hemodialysis twice weekly. Compared with the composition of plasma, the dialyzing fluid for hemodialysis should be rich in= Bicarbonate
- Dialyzing fluid as compared to normal plasma contains: = Glucose more than plasma
    - It is also asked as
        - Dialyzing fluid has a glucose content of = More than normal plasma glucose
        - Dialysis fluid contains = More glucose than plasma
- Compared with plasma, the dialyzing fluid for hemodialysis should be rich in = Bicarbonate
- An increase in which parameter in a patient undergoing dialysis would be alarming = Potassium

171. GFR IS CALCULATED CLINICALLY BEST WITH = CREATININE

REMEMBER

- ✓ Best way to measured GFR clinically by =creatinine clearance
- ✓ Best way to check renal function= creatinine clearance
- ✓ Best way to measure GFR = inulin Clearance
- ✓ Best way to measure renal plasma / blood flow = PAH

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- What is the best way to calculate GFR clinically in a CKD patient awaiting a decision between transplant and dialysis? = Creatinine clearance
    - It is also asked as
        - GFR can be estimated by = Creatinine clearance
        - GFR can be estimated in a clinical setting by = Creatinine clearance
        - Clinically GFR is calculated by = Creatinine Clearance

- The best method to measure GFR is = Inulin clearance
    - It is also asked as
        - Most accurate measure of GFR is by = Inulin
        - Best test for measuring GFR is = Inulin clearance
- Renal plasma flow is determined by = PAH
- Creatinine is used for clinical measurement of GFR over urea because = Not reabsorbed in blood
- Endogenous substance used to measure GFR = Creatinine

---

172. HIGHEST RENAL CLEARANCE IS OF = PAH

FOR SUCH MCQ'S REMEMBER

- Clearances of Substances
    - **MNEMONIC:** Pa K- India Usually Never Gives Appreciation and Hate each other
    - PAH > K^+ (high-K^+ diet) > Inulin > Urea > Na^+ > Glucose, Amino acids, and HCO3

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Best indicator of renal clearance= inulin
- Which of the following has the least renal clearance=glucose
- Half-life of a drug depends on = Renal clearance
- Which one of the following has highest renal clearance = PAH (Para-aminohippuric acid)
- The volume of plasma from which all of a substance is removed (per unit time) and excreted into the urine is termed as = renal clearance.
- If a substance is found in the renal artery but not in the renal vein = Clearance is equal to renal plasma flow
- Product of GFR and plasma concentration of substance = Filtration load
- If a substance has properties more than inulin what will happen to it= Secretion plus filtration

---

173. BOTH GFR AND RPF WILL BE INCREASED DUE TO = DILATION OF AFFERENT ARTERIOLES

REMEMBER

✓ ↑ P_{GC} (dilation of afferent and constriction of efferent, OR increases in hydrostatic pressure)→↑GFR

✓ ↑P_{BS} (constriction of ureter)→ ↓ GFR

✓ ↑ πGC (increases in protein concentration) → ↓ GFR

CHANGES IN GLOMERULAR DYNAMICS

	GFR	RPF	Filtration Fraction (GFR/RPF)
Afferent Arteriole Constriction	↓	↓	---
Efferent Arteriole Constriction	↑	↓	↑
↑ Plasma Protein Concentration	↓	---	↓
↓ Plasma Protein Concentration	↑	---	↑
Constriction of ureter	↓	---	↓
Dehydration	↓	↓↓	↑

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- The glomerular filtration rate will increase if = The plasma protein concentration decreases.
    - It is also asked as
        - GFR increases with = Decreased plasma protein.
        - GFR increased by = Decrease plasma albumin.
        - GFR decreases when = Increase oncotic pressure.

- GFR increases with = Decrease in plasma osmotic pressure.
  - It is also asked as
    - GFR decreases by = Increase in plasma osmotic pressure.
- One of the following would cause an increase in both glomerular filtration rate and renal plasma flow = Dilatation of the afferent arteriole
  - It also comes as
    - Increase GFR = Moderate afferent dilation.
    - Increase in both renal blood flow and GFR are caused by = Dilation of the afferent arterioles.
    - The most likely condition to cause an increase in the glomerular filtration rate is = Dilatation of the afferent arterioles.
    - GFR increase with = Decrease afferent arteriole resistance.
    - The glomerular filtration rate (GFR) is decreased by = Afferent arteriolar constriction
- Which will increase GFR = Moderate constriction of efferent arterioles.
  - It is also asked as
    - GFR increased by = efferent arteriole constriction.
- Pressure in the glomerular capillaries is higher because = Afferent arterioles are short.
- Decrease GFR leads to = Decrease creatinine clearance.
- Sympathetic stimulation causes = Decreased blood flow and decreased GFR.
- Ureteric obstruction causes = Decreased GFR.
- RTA blood loss, GFR decreased due to decrease in = Arterial blood flow.
  - It is also asked as
    - In hypovolemic shock, the decrease glomerular filtration is due to = Decrease arterial blood flow.
- In chronic renal failure, there is increased urea due to = Decreased GFR.

---

174. WHICH HORMONE CAUSES SMOOTH MUSCLE CONSTRICTION IN ARTERIOLES= ADH

REMEMBER

Angiotensin-II	❖ Maintains blood volume and BP ❖ Affects baroreceptor function; limits reflex bradycardia ❖ Potent vasoconstrictor (afferent & efferent arterioles)
ANP, BNP	❖ Released from atria (ANP) and ventricles (BNP) in response to ↑ volume ❖ Inhibits RAAS; Relaxes vascular smooth muscle via cGMP → ↑ GFR, ↓ renin. ❖ Dilates afferent arteriole, promotes natriuresis.
ADH	❖ Regulates serum osmolality; responds to low blood volume ❖ Stimulates water reabsorption in collecting ducts ❖ Secretion is increased by ↑ Serum osmolarity, Volume contraction, Nausea (powerful stimulant). ❖ Secretion is decreased by ↓ Serum osmolarity ❖ Contraction of vascular smooth muscles and constriction of arterioles
Aldosterone	❖ Primarily regulates ECF volume and Na+ content; responds to low blood volume states. ❖ Responds to hyperkalemia by ↑K+ excretion. ❖ K+ ions is the most effective stimulant for aldosterone secretion

NOW LET'S SOLVE SOME PAPER MCQ'S

ANGIOTENSIN II AND RELATED MECHANISMS

- The hormone which increases arteriolar resistance is: = Angiotensin II
  - It also comes as
    - Circulating angiotensin II= Causes most arterioles to constrict

- One of the classified functions of kidneys is regulation of blood pressure through the renin-angiotensin-aldosterone mechanism. Angiotensin-II mainly causes = Vasoconstriction of arterioles
    - It is also asked as
        - Vasoconstriction is caused by: = Angiotensin
        - The major short-term action of angiotensin-II is: = Vasoconstriction of arterioles
        - Initial short-term action of angiotensin 2? = Vasoconstriction
- Angiotensin II does NOT cause: = Promotion of salt excretion by renal tubules
- The renin-angiotensin-aldosterone system does NOT regulate: = Nitrogen balance
- In Hemorrhage, the blood volume is brought back to normal by? = Angiotensin 2
- In hemorrhage patient, aldosterone level is increased by = Angiotensin 2
- Which of the following is activated in the lung? = Angiotensin 2
- Factor inhibiting the secretion of renin is an increase in: = Angiotensin II
    - It is also asked as
        - Renin secretion is inhibited by = Angiotensin II
- Angiotensin II is responsible for = Stimulation of thirst center

Aldosterone and Potassium Regulation

- Aldosterone secretion is significantly increased by = Angiotensin II
    - It is also asked as
        - In hemorrhage patients, aldosterone level is increased by? = Angiotensin 2
- Aldosterone = Is the most active mineralocorticoid
- Angiotensin-II plays its role in long-term regulation of blood pressure mainly through: = Stimulation of aldosterone secretion
- The most important stimulus increasing aldosterone secretion without affecting glucocorticoid secretion is: = Hyperkalaemia
- Adrenal cortex secretes which of the following? = Aldosterone
- Aldosterone acts on = Nucleus
    - Note that --- Aldosterone exerts its effects via intracellular mechanisms rather than acting directly on cell membranes
- Total body electrolytes and water is regulated/maintained by kidney Which involved = Aldosterone
- MOA of aldosterone at cellular level= Act on Nuclear receptor
- Aldosterone strongest stimulus= Increase potassium
- Aldosterone chiefly acts on= Collecting tubules
    - Remember the sequence
    - Aldosterone acts on → Cortical Collecting Tubules (CCT) > Distal Convoluted Tubules (DCT) > Collecting Ducts (CD)
    - Antidiuretic Hormone (ADH) acts on → Collecting Ducts (CD) > Distal Convoluted Tubules (DCT)

ADH (Antidiuretic Hormone) and Related Mechanisms

- An increase in the osmolality of the extracellular compartment: = Stimulates the volume and osmoreceptors, and stimulates ADH secretion
- ADH increases = The permeability of the collecting tubules of the kidneys to water
- ADH secretion is increased in = Early post-operative period
- ADH will be released from the posterior pituitary when there is a decrease in plasma= Volume
- Water loss from sweating causes an increase in = ADH secretion
- ADH secretion by hypothalamus is inhibited by = Decreased blood osmolarity
- During summer, in a fasting man, the urine becomes concentrated because of: = Secretion of ADH
- ADH is decreased by? = Alcohol
- In dehydration, ADH = Increases permeability through CD
- Vascular vasoconstriction caused by = ADH
- Cause of ADH suppression is = Increase plasma volume
- Which of the following causes smooth muscle contraction = ADH

- Which of the following leads to vascular smooth muscle contraction and uses inositol 1,4,5-triphosphate (IP3) as a second messenger = ADH

ELECTROLYTES AND VOLUME REGULATION

- Hyponatremia caused by = Increase body water
- Which of the following decreases blood volume = ANP
- Renin secretion is inhibited by = ANP > Angiotensin II
- Increased renal sodium in Hyperaldosteronism due to = Decreased capacity of renal tubules to absorb Na

175. MOLE FOR MOLE NA ABSORPTION IS GREATEST BY WHICH ONE OF THE FOLLOWING=ALDOSTERONE

ABOUT HORMONES ACTING ON KIDNEY

Hormone	Actions on the Kidneys
PTH	↓ Phosphate reabsorption (proximal tubule) ↑ Ca2+ reabsorption (distal tubule) Stimulates 1α-hydroxylase (proximal tubule)
ADH	↑ H2O permeability (late distal tubule and collecting duct principal cells)
Aldosterone	↑ Na+ reabsorption (distal tubule principal cells) ↑ K+ secretion (distal tubule principal cells) ↑ H+ secretion (distal tubule α-intercalated cells)
ANP	↑ GFR ↓ Na+ reabsorption
Angiotensin II	↑ Na+–H+ exchange and HCO3- reabsorption (proximal tubule)

NOW LET'S SOLVE SOME PAPER MCQ'S

- A patient admitted in endocrinology ward has the following labs. Potassium: 3 and Na: 150 and pH 7.45 He is most likely having an excess of which hormone=Aldosterone
- Aldosterone causes=Na and Cl reabsorption
- Aldosterone causes a decrease in the renal tubular secretion of= Sodium
    - It is also asked as
        - The aldosterone= Increases sodium reabsorption by the nephron
        - The hormone responsible for sodium reabsorption in the distal and collecting tubule is = Aldosterone
        - Sodium absorption increases at DCT due to = Aldosterone
        - Aldosterone decreases secretion of = Sodium
        - Most potent sodium-retaining hormone is = Aldosterone
- Total body electrolytes and water is regulated/maintained by kidney Which involved = Aldosterone
- Short term function of aldosterone=Increases permeability of NA and K in cortical collecting tubule
- Total body electrolytes and water is regulated/maintained by kidney. Which involved = Aldosterone
- Maximum water and Na are absorbed by the effect of= Aldosterone
- A person who is fasting does not take water for many hours, excretes concentrated urine due to secretion of increased amount of= Antidiuretic hormone

176. ALDOSTERONE MOST IMPORTANT STIMULUS= INCREASE POTASSIUM

REMEMBER:

- K+ ions is the most effective stimulant for aldosterone secretion
- Hyperkalemia → It ↑ aldosterone secretion. Aldosterone ↑ renal K+ secretion, restoring serum [K+] to normal.

NOW LET'S SOLVE SOME PAPER MCQ'S

- ❖ An increase in the concentration of plasma potassium causes increase in= Secretion of aldosterone
- ❖ Potassium secretion in renal tubules is primarily under the control of: = Aldosterone
- ❖ The most potent stimulus for aldosterone is = Increased potassium
- ❖ The most potent stimulus for aldosterone release is = Hyperkalemia
- ❖ Main stimulus for aldosterone release is = Hyperkalemia
- ❖ An increase in the concentration of plasma potassium causes an increase in = Secretion of aldosterone
- ❖ Aldosterone secretion increases with = Increased plasma concentration of potassium
- ❖ Aldosterone is the most potent mineralocorticoid; its secretion is greatly stimulated by a rise in= Plasma K+ concentration

177. THIRST STIMULATION IN HYPOTHALAMUS IS DUE TO= ANGIOTENSIN 2

ABOUT THIRST

- ❖ Stimulated by:
    - o Angiotensin II (RAAS activation), Increased plasma osmolarity, Decreased plasma volume, Extracellular dehydration
- ❖ Reduced by:
    - o Increased extracellular fluid volume, stretch receptors (like atrial stretch) signaling adequate blood volume & Gastrointestinal distention.

NOW LET'S SOLVE SOME PAPER MCQ'S

- ❖ Thirst is stimulated in activation of renin-angiotensin system due to = Angiotensin 2
- ❖ Thirst is reduced by = Increased volume of extracellular fluid
- ❖ Thirst is mainly caused by = Extracellular dehydration
- ❖ Thirst is stimulated by = An increase in plasma osmolarity and a decrease in plasma volume
- ❖ Thirst is partially alleviated by = GIT distention
- ❖ Thirst is decreased by= Baroreceptor afferent

178. RENIN SECRETION IS INCREASED. IT CAUSES VASOCONSTRICTION BY INCREASING THE CONCENTRATION OF=ANGIOTENSIN-2

REMEMBER

Renin	❖ Secreted by JG cells in response to ↓ renal perfusion pressure (detected by renal baroreceptors in afferent arteriole) ❖ ↑ by renal sympathetic discharge (β1 effect), and ↓NaCl delivery to macula densa cells.
Renal Artery Stenosis (RAS)	❖ ↓ Renal perfusion → ↑ Renin → ↑ Angiotensin → Secondary HTN. ❖ Causes: o Atherosclerosis--(proximal artery, older males, smokers). o Fibromuscular dysplasia - (distal artery, young/middle-aged females). ❖ Unilateral RAS: o Affected kidney atrophies, asymmetric size, ↑ renin in affected kidney, ↓ renin in unaffected kidney. ❖ Bilateral RAS: o Sudden creatinine rise with ACE inhibitors/ARBs/renin inhibitors. ❖ Symptoms: Severe HTN, flash pulmonary edema, epigastric/flank bruit.

NOW LET'S SOLVE SOME PAPER MCQ'S

RENIN SECRETION AND REGULATION

- A decrease in the effective circulating volume will result in an increase in = Renin secretion
  - It is also asked as
    - The most important change in renal function that tends to conserve blood volume includes. Increased renin secretion.
    - The main outcome of a decrease in effective circulating volume is = Increase in renin secretion
- A young patient with high renin levels likely has increased renin due to = Sympathetic stimulation via renal nerve
- The most potent stimulus for secretion of renin from kidney is = Hypotension
  - It also comes with different options
    - Which of the following stimulate renin secretion? = Inc K concentration
    - Renin secretion by the kidney is increased by increasing = Sympathetic nerve activity
    - Decrease Na delivery to macula densa causes release of? = Renin
    - Diminished sodium chloride delivery to the macula densa stimulates the release of = Renin
    - In one MCQs there was an option of all ---sympathetic stimulation, hypotension, Decrease NaCl delivery---remember Hypotension > Sympathetic stimulation > Decreased NaCl tubular load
- Renin release from the juxtaglomerular apparatus is inhibited by = Increased pressure within the afferent arterioles
  - Renin is inhibited by = Increased pressure in afferent arterioles
- Renin in the circulation originates mainly from= Juxtaglomerular cells
- Increased Renin level is caused by = Decreased stretch in right atrial mechanoreceptors
  - It is also asked as
    - Renin secretion is increased by = Decreased stretch in right atrial mechanoreceptors
- Persistent increase renin occurs in= Secondary Hypertension
- Patients with renal artery stenosis may present with very high blood pressures due to increased renin secretion. Which of the following structures in the kidney is responsible for sensing inadequate perfusion and secreting renin=Juxtaglomerular cells
  - It also comes as
    - Increased hormone secretion in renal artery stenosis is from= JG cells
    - BP of pt 180/110 and erythropoietin was decreased creatinine raised, possible site of defect was asked=Juxtaglomerular cells
    - A young patient with decrease urine output, BP 210/160 taking antihypertensives and creatinine raised. Defect is in= Juxtaglomerular cells

RENIN-RELATED SCENARIOS

- Patients with renal artery stenosis may present with very high blood pressures due to= increased renin secretion.
- A 30-year-old pt presented with headache BP: 170/120, he has high aldosterone, left renin level is high and right renin level is normal. What is your diagnosis? = Left renal artery stenosis
- In a 50-year-old diabetic male with renal artery obstruction and resultant increased renin secretion, it will cause = Angiotensin 2 induced vasoconstriction
- A female with pH 7.5, hypokalemia, normal sodium, normal cortisol but raised Renin level. Diagnosis = Renal artery stenosis
- Decreasing the resistance of the afferent arteriole in the kidney will decrease = Secretion of renin
- In denervation of kidney, which of the following occurs=Increase renal blood flow
  - Denervation reduces sympathetic vasoconstriction, causing vasodilation and increased renal blood flow.
- In a live donor for transplantation of a kidney, one of the following tests is NOT mandatory =Serum renin levels
- Most important change in kidney to preserve blood volume is = Increased renin secretion

179. IN AN ATHLETE, AFTER HEAVY EXERCISE WHAT WILL HELP TO CONSERVE NA/WATER= RENIN ANGIOTENSIN ALDOSTERONE MECHANISM

NOTES ABOUT ATHLETE

- Stroke Volume: Permanently increased in well-trained athletes at rest.
- Cardiac Output: Higher in professional athletes; heart rate is lower than non-athletes.
- Heat Loss: Maximum through sweating.
- Oxygen Consumption: Higher in athletes compared to non-athletes.
- Distilled Water Post-Marathon: Decreases urine osmolarity.
- Steroid Use: Increases risk of hepatocellular carcinoma.

NOW LET'S SOLVE SOME PAPER MCQ'S

- In well-trained athletes at rest, there is a permanent increase in = Stroke volume
  - It also comes as
    - A trained athlete at rest has increased = Stroke volume
    - During rest, in a well-trained athlete, there is an increase in = Stroke volume
    - Athlete has more than normal person = Stroke volume
- Athlete heart differs from non-athlete heart in = Increased stroke volume and decreased heart rate
- Person with HR 42 and stroke volume 110 ml. Diagnosis = Professional athlete
- Two athletes are sitting in a room: one professional and one new. The professional has a greater = Cardiac output
- Post-exercise mechanism to conserve Na/water = Renin-angiotensin-aldosterone mechanism
- In athletes, increased Sodium absorption in DCT is due to = RAAS
- Condition in an athlete drinking distilled water post-marathon = Decreased urine osmolarity
- Athlete taking anabolics with Hb 19.6 g/dL and hematocrit 58%. Cancer risk = Hepatocellular carcinoma
- Athlete with redness and indurated lines spreading up the leg. Cause = Strep pyogenes
- A Black athlete presented with 3rd degree burn; he is likely to develop = Keloid
- Athletes differ from normal individuals in having = A higher maximum oxygen consumption
- In athletes, maximum heat loss occurs through = Sweating
  - It is also asked as
    - A 36-year-old athlete who works out excessively. During her exercise, increased water loss will be through = Sweating

180. HCO3 REABSORPTION OCCURS THROUGH WHICH SEGMENTS OF NEPHRON= PCT + COLLECTING DUCTS

CONCISE NOTES ON TUBULAR FUNCTION

- Proximal Tubule (PCT)
  - Reabsorbs majority—Na+ (67%), H20, K+ (67%), Urea (50%), Phosphate (85%)
  - Glomerulotubular Balance: it means that even if GFR↑ still it maintains constant fractional reabsorption (two-thirds, or 67%) of the filtered Na+ and H2O
- Loop of Henle
  - NaCl: Reabsorbs 25%
  - K+: Reabsorbs 20% via Na+–K+–2Cl- cotransporter.
  - Urea secreted here
  - Thick ascending limb impermeable to water, called diluting segment.
- Distal Tubule and Collecting Duct
  - Together reabsorb 8% of the filtered Na+.
  - Early DT: Impermeable to water like thick ascending limb so called cortical diluting segment
  - NaCl:
  - Early DT: Reabsorbs 8%, impermeable to water (cortical diluting segment).
  - Late DT and Collecting Duct:

- Principal cells reabsorb Na^+ and H_2O, secrete K^+.
- α-Intercalated cells secrete H^+, or reabsorbs K^+ by an H^+, K^+-ATPase

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

PROXIMAL CONVOLUTED TUBULE (PCT)

- The part of the nephron where the greatest fraction of water is reabsorbed = Proximal convoluted tubule
  - It is also asked as
    - In dehydration, water is mainly absorbed from = Proximal convoluted tubule (PCT)
    - 60-80% water is absorbed from? = PCT
    - In the presence of ADH, water is maximally reabsorbed from = PCT
    - In which part of the kidney does 60-80% of the filtered water gets reabsorbed within 24 hours = PCT
    - 65% water reabsorption without ADH is done in = PCT
- Glucose is mostly absorbed by which segment of nephron? = PCT
  - It is also asked as
    - Glucose is absorbed by which segment of the nephron? = PCT
    - Tubular reabsorption of glucose and amino acids in nephrons occurs in = PCT
    - Which of the following is absorbed to maximum from PCT = Glucose
    - Most of the glucose that is filtered through the glomerulus undergoes reabsorption in the = proximal tubule.
- Absorption of Bicarb occurs in = PCT
- Bicarbonate ions are reabsorbed from nephrons in = Proximal and distal tubules
  - It also comes with different options
    - Bicarbonate is absorbed in which segment of nephron = PCT and collecting duct
    - Prefer PCT and Collecting ducts if both in options in same MCQ
- Renal tubules normally reabsorb: = All filtered HCO3 in respiratory acidosis
- Glucose absorption in tubules (PCT) occurs by which mechanism? = Secondary active transport with sodium (co-transport)
  - This comes with different options
    - Glucose and amino acids are reabsorbed in the proximal tubule by= Active transport (specifically secondary active transport)
    - Luminal side of the nephron reabsorbs glucose by= Co-transport
    - Glucose are absorbed in PCT by = Secondary active transport
    - Active glucose absorption occurs in which part of nephron = PCT
  - Note this
    - The co-transport mechanism occurs on the luminal side.
    - The active transport mechanism occurs at the basolateral side to move glucose into the blood
- Reabsorption of sodium in the kidney: = Occurs by active transport in the proximal tubule
- The substance maximally reabsorbed from renal tubules into plasma is: = Glucose
- Tubular reabsorption of glucose, bicarbonate, and amino acids occurs in which part of the nephron? = PCT
  - It also comes as
    - Most glucose and amino acid absorption occur in nephron region = PCT
    - Most glucose absorption occur in which part of nephron = PCT
- Regarding Nephron = More microvilli in PCT
  - It also comes as
    - The brush border on PCT are formed by=Microvilli
- As fluid moves from the proximal PCT to the distal PCT, the concentration of = Creatinine increases.

  - It also comes as
    - Substance concentration increased in lower PCT compared to upper PCT = Creatinine
- Frothy urine with pink cytoplasm in PCT cells is likely due to = Reabsorption of protein
- Mechanism of Cl reabsorption in later segment of PCT is = Passively due to concentration gradient
- Osmotic diuretic acts on which of the following parts of nephron? = Proximal tubules
- Women, hemorrhage, which part affected = PCT
- Maximum sodium is absorbed in which part of nephron = PCT
- The fluid in the distal part of the proximal convoluted tubule has = A higher urea concentration than the fluid in Bowman's capsule
- The pH of the tubular fluid in the distal nephron can be lower than that in the proximal tubule because = The tight junctions of the distal nephron are less leaky to solute than those of the proximal tubule
- Tubular fluid has a low pH than PCT due to = More H ions are secreted in DCT
- Mechanism of Cl reabsorption in later segment of PCT is = Passively due to concentration gradient
- H+ secretion from PCT in exchange of= Na+
  - It also comes with different option
    - H+ secretion from PCT is in exchange of = NH3.
    - While H^+ is primarily secreted in exchange for Na^+ (Not in this MCQ), Secreted H^+ reacts with NH_3 in the tubular lumen to form NH_4^+ (ammonium), which is then excreted in the urine.
- H+ ion secretion in the kidney causes= Bicarbonate reabsorption
  - It also comes as
    - The secretion of H+ in the proximal tubule is primarily associated with: = reabsorption of bicarbonate ion.

DISTAL CONVOLUTED TUBULE (DCT)& COLLECTING DUCT

- Following dietary irregularity, K+ is secreted at which part = DCT
  - It also comes as
    - The segment of the nephron which contributes most to potassium excretion because of altered dietary potassium is = Distal tubule
- In a dehydrated patient, diluted fluid is found in which segment of kidney = DCT
- A female with the problem of concentrated urine, the kidney secretes hyperosmotic urine by decreasing water content in = Distal convoluted tubule (DCT)
- In dehydration, concentration of which of these is decreased = Pure water
- On structural basis how will you differentiate between PCT and DCT = Brush border
  - It also comes as
    - Difference between PCT and DCT is = PCT has extensive brush borders
    - Brush border is associated with = PCT
- The part of the nephron known as the diluting segment is the = Early distal convoluted tubule.
- Under the influence of antidiuretic hormone (ADH), the largest volume of water is reabsorbed by = Medullary collecting duct
- In the presence of ADH, maximum absorption of water takes place in? = PCT
  - This reabsorption is obligatory and occurs regardless of ADH levels
  - While in Collecting Duct Significant water reabsorption occurs here under ADH influence, but the total volume is less than that in the PCT
- In the presence of ADH, the filtrate will be isotonic to plasma in the = Cortical collecting tubule
- Tubular fluid has a lower pH than PCT due to = More H+ ions secreted in DCT

LOOP OF HENLE

- True about thin loop of Henle = Flattened cells
- Segment impermeable to water in nephron = Thick Ascending Loop of Henle
- The blood vessels that run in the kidney especially along the loop of Henle = Vasa recta
- Fluid entering the loop of Henle from the proximal convoluted tubule: = has a higher urea than plasma.

KNOW THE DIFFERENCE

- A young female had post-partum hemorrhage and developed acute renal failure. What structure is most likely affected? = PCT
  - It also comes as
    - In a hypotensive patient due to severe blood loss, which part of the kidney is damaged the most? = PCT
- A type II diabetes patient has weakness and increased frequency of urination for two weeks. The mechanism of polyuria is = Decreased reabsorption of glucose in PCT
- A person had 1.5L hemorrhage and has decreased GFR and urine output. Which of the following will help more in returning the GFR to normal = DCT
  - It is also asked as
    - A person has lost blood. He has decreased GFR and urinary output. The part of renal tubules most involved in bringing back the GFR and urinary output to the normal is = Distal convoluted tubules
    - In a person with 2L of blood loss, the blood volume will be replaced back by? = DCT
- As a result of dehydration, hypotonic fluid is present in = DCT
  - It also comes as
    - After dehydration, in which part of nephron the most hypotonic urine will be present = DCT
    - A female with the problem of concentrated urine, the kidney secretes hyperosmotic urine by decreasing water content in = Distal convoluted tubule (DCT)
    - After dehydration, the most hypotonic urine will be in the = DCT
    - Diluted fluid in the kidney in a dehydrated patient is found in? = DCT
- The nephron is able to make concentrated urine due to = Increased permeability in the thick limb of the loop of Henle

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181. THIAZIDE DIURETICS ACTS ON = DT

MECHANISM & SITE OF ACTION OF DIURETICS

Diuretic Class	Site of Action	Mechanism
Carbonic Anhydrase Inhibitors (e.g., Acetazolamide)	Early PCT	Inhibit carbonic anhydrase, reduce HCO_3^- reabsorption
Loop Diuretics (e.g., Furosemide)	Thick ascending limb of Henle	Inhibit cotransport system (Na+/K+/2Cl−) of thick ascending limb of loop of Henle
Thiazide Diuretics	Early DT	Inhibits Na and Cl absorption.
K^+-Sparing Diuretics (e.g., Spironolactone)	Collecting ducts	Dec Na+ reabsorption and Dec K+ excretion
Osmotic Diuretics (e.g., Mannitol)	PCT	

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

LOOP DIURETICS

- Loop Diuretics (furosemide), acts on = Thick ascending limb of the loop of Henle
- The diuretic acting on the ascending loop of Henle is = Furosemide
- Mechanism of action of loop diuretic is = Inhibit co-transport system (Na/K/2Cl) of thick ascending limb of loop of Henle
- Synergistic effect of thiazide and loop diuretics on diuresis comes from = Ascending limb of loop of Henle
- Furosemide MOA = Inhibit Na+-K+-2Cl−
- An important therapeutic or toxic effect of loop diuretics is = Decreased blood volume

OTHER DIURETICS

- Thiazide drug mechanism? = Inhibit Na/Cl in early DT
  - It also comes as
    - Thiazide diuretics act upon = Early distal tubule
- Regarding DCT which of the following is correct? = Site of action of thiazide diuretics
- Which amongst the following is a Potassium sparing diuretic = Amiloride
- K-sparing diuretic like spironolactone acts by? = Inhibiting Na/K exchange
- K+ sparing diuretics acts on = collecting ducts
- Mechanism of action of osmotic diuretic? = Increased Na/K excretion
- Osmotic diuretic acts on = Proximal tubules
  - It is also asked as
    - Osmotic diuretic act on which part of kidneys= PCT
- Mechanism of Action of Acetazolamide= Decrease H^+ secretion and increase Na^+, K^+ excretion
  - It also comes as
    - Acetazolamide exerts diuresis by = Decreased H+ secretion with resultant increase in Na+ and K+ excretion
- Carbonic anhydrase inhibitors promote diuresis by acting mainly upon: = Proximal convoluted tubule
  - It is also asked as
    - Carbonic anhydrase inhibitors (e.g., acetazolamide) = act on the early PCT
- In a person taking carbonic anhydrase inhibitors for 4 weeks now, what changes will occur? = Decrease HCO3 in blood
- Zinc is an essential constituent in one of the following = Carbonic anhydrase

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182. THIAZIDE DIURETIC CAUSE – HYPOKALEMIA.

REMEMBER

- Thiazide and loop diuretics causes= hypokalemia, hyponatremia
- While K-sparing diuretics causes- hyperkalemia
- Thiazide diuretics causes = Hypokalemia> Hyperuricemia >Hypercalcemia

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Loop diuretics causes= Hypokalemia
- A known diabetic hypertensive patient presents with bilateral pedal edema. Which drug can alter his glycemic control? = Hydrochlorothiazide
- Chlorothiazide diuretics most likely produce = Hyperuricemia
- Thrombocytopenia is a side effect of = Thiazides
- Thiazides often reduce the excretion of = Lithium ion
- The most useful agent in the treatment of recurrent calcium stones is = Hydrochlorothiazide
- An antihypertensive drug that increases triglyceride levels? = Thiazides
- Digoxin toxicity is increased by = Hydrochlorothiazide
- Therapeutic and toxic side effect of Loop diuretics is=Low blood volume

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183. MOST IMP BUFFER IN BLOOD = HCO3

BUFFERS IN THE BODY

- Extracellular Buffers:
  - Major buffer: Bicarbonate (HCO_3^-)
  - Minor buffer: Phosphate (important in urine)
- Intracellular Buffers:
  - Major buffer: Proteins (e.g., hemoglobin; deoxyhemoglobin > oxyhemoglobin)
  - Other buffers: Organic phosphates (AMP, ADP ,ATP)
- Simplified Categorization:

- Blood/Plasma Buffer: Bicarbonate (HCO_3^-)
- Renal Tubular/Urinary Buffer: Phosphate (HPO_4^{2-})
    - Qualitative importance: Phosphate
    - Quantitative importance: Ammonia (NH_3/NH_4^+)
- Exclusive Renal Buffer: Ammonia

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Most important blood buffer = HCO3
    - It also comes as
        - Main buffer of the blood = HCO3
        - Highest proportion of which buffer is present in plasma = HCO3
        - Highest proportion of which buffer is present in blood = HCO3
        - The most important buffer in blood is = Bicarbonate
- Important Interstitial buffer = Bicarbonate (HCO3)
- Most important ECF buffer = HCO3
    - Know the difference
        - Most important ICF buffer = Protein
- The body's intracellular buffer consists primarily of = Protein
- Which buffer acts in DKA = Bicarbonate
- Buffer, exclusively of the renal tubule is = Ammonia
    - It is also asked as
        - The buffer system present exclusively in renal tubules is = Ammonia buffer system
        - Ammonia is the best buffer in urine because = NH4 is impermeable to tubules
- Buffer of renal system = Phosphate
- Hb acts as a buffer because = It accepts H+.
    - It is also asked as
        - Hemoglobin is a conjugated protein present in red blood cells. It functions as an important buffer as it accepts= H+.
- The daily production of hydrogen ions from CO2 is primarily buffered by = Red blood cell hemoglobin.
- Which amino acid of hemoglobin acts as buffer to acids and accepts H+ ions = Histidine
- Oxygen buffer function = Negative feedback
- Oxygen buffering system mechanism = Chemoreceptors

KNOW THE DIFFERENCE

- Buffer which is PRESENT in kidney but not in body fluids= ammonia
- Which buffer is IMPORTANT in kidney but not in plasma=Phosphate

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184. APT. WITH CO2=44, PH=7.33, HCO3=19, WHAT ACID BASE ABNORMALITY? = METABOLIC ACIDOSIS

NOTE SOMETIMES THE COMPENSATION RULE IS ALSO ASKED

- **Normal values**

pH	7.35-7.45 (below 7.35 is acidic and above 7.45 is alkalosis)
CO_2	35-45 (less than 35 alkalosis, and above 45 acidosis)
HCO_3	22-26 (below 22 acidosis and above 26 alkalosis)

Disorder		pH	Primary defect	Compensatory response
Metabolic Acidosis		↓	↓HCO_3^-	↓PCO_2
Metabolic Alkalosis		↑	↑ HCO_3^-	↑ PCO_2
Respiratory Acidosis	Acute	↓	↑ PCO_2	↑ HCO_3^-
	Chronic	↓	↑ PCO_2	↑ HCO_3^-
Respiratory Alkalosis	Acute	↑	↓ PCO_2	↓HCO_3^-

	Chronic	↑	↓ PCO_2	↓HCO_3^-

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

ACIDOSIS AND ALKALOSIS

- In a state, where there is fall in pH of plasma, increase in Bicarbonate and increase in PCO_2, there is= Partially compensated respiratory acidosis
  - For this and coming question remember
    - (↓ Ph. ↑Co2= respiratory acidosis, with compensation from renal by increasing bicarbonate, but as it fails to bring pH. towards normal so partially compensated respiratory acidosis)
- Ph=7.32, Pco2=50, HCO3=24, increased anion gap. Diagnosis = Respiratory acidosis
- Patient came in ill condition. His ABGs shows pH 7.32, Pco2 60, HCO3 24, normal anion gap. Diagnosis = Uncompensated respiratory acidosis
  - It is also asked as
    - Asthmatic patient with pH 7.31, HCO3 25, Pco2 48. Which is your diagnosis = Respiratory acidosis uncompensated
    - The most likely biochemical diagnosis for a patient with pH 7.37, PCO2 48 mmHg, and HCO3 30 mEq/l is = Compensated respiratory acidosis
    - ABGs showing pH 7.32, HCO3 35, PCO2 70 indicate = Compensated respiratory acidosis
    - A 38 years old male patient presents to the medical clinic with cough, difficulty in breathing, and wheeze. He gives a history of asthmatic attacks in the past. His arterial blood gases showed pH = 7.32, [HCO3-] = 25 mEq/L, PCO2 = 50 mmHg. The most likely diagnosis is = respiratory acidosis without renal compensation.
- Which remains normal in chronic respiratory acidosis = H+ concentration remains normal
- Patient has chronic respiratory acidosis. For every 10 rises in CO2, the compensatory rise in HCO3 = 4
- In a patient with CO2=44, pH=7.30, and HCO3=19, the acid-base abnormality is = Metabolic acidosis
  - It is also asked as
    - A patient with CO2 = 44, pH = 7.30, HCO3 = 19. What acid-base abnormality? = Metabolic acidosis
    - A patient with CO2 39, pH = 7.30, HCO3 = 14. The acid-base abnormality is = Metabolic acidosis
- ABGs showing pH 7.3, pCO2 38, HCO3 17 suggest = Partially compensated metabolic acidosis
  - It is also asked as
    - ABGs show pH 7.32, pCO2 20, pO2 90, HCO3 18. The acid-base disorder is = Partially compensated metabolic acidosis
    - A patient enters the emergency room exhibiting signs of hypoxia. Lab values while breathing room air are PaO2 95 mmHg, PaCO2 30 mmHg, pH 7.36, HCO3 16 mEq/L, Hb 15 gm%, SaO2 40%, PCO2 40 mmHg, Cardiac Output 6 liters/min. The most likely acid-base status of the patient is = Compensated metabolic acidosis
    - PH. 7.36; HCO3 16 and pCO2 30. Which condition = Compensated metabolic acidosis
- Blood gas analysis of patient showing PH 7.5, HCO3 32 and pCO2 40. What is the condition he is in = Uncompensated metabolic alkalosis
  - It is also asked as
    - ABGs showing pH 7.50, pCO2 50, pO2 95, and HCO3 30 indicates = Partially compensated metabolic alkalosis
    - ABG with pH 7.5, pCO2 40, HCO3 30 indicates = Uncompensated metabolic alkalosis
- Cut off value for metabolic alkalosis is HCO3 = More than 26
  - It comes with different options too
    - Diagnostic Value for metabolic alkalosis is= HCO3 > 24 (normal midpoint value of HCO3)
- In chronic respiratory acidosis, what is almost equal to normal in blood? = Alveolar ventilation

- In chronic respiratory acidosis, how much HCO3 rises occurs for every 10 mmHg rise in pCO2? = 3 mmol/L
- Respiratory acidosis is primarily caused by: = Hypoventilation
- Hyperventilation, normal CT head, ABG shows pH 7.4, pCO2 30, HCO3 18. Diagnosis? = Compensatory respiratory alkalosis
    - It is also asked as
        - The most likely biochemical state in a patient with pH 7.4, PO2 62 mmHg, and PCO2 31 mmHg is = Compensated respiratory alkalosis
        - A patient had a car accident but didn't get any external injuries. His pH is 7.5, PCO2 is 20mmHg, and HCO3 is 20mmHg = Respiratory alkalosis
        - A resident living at 12000 feet altitude complains of illness. What is the diagnosis = Respiratory alkalosis

Mixed Acid-Base Disorders

- The ABGs of a patient in ICU are as follows: pH 7.25, pCO2 60, HCO3 16, pO2 70. Diagnosis = Mixed respiratory metabolic acidosis
- A patient with pH 7.2, HCO3 16, and PCO2 50mmHg likely has = Mixed metabolic acidosis with respiratory acidosis
- ABGs of a patient are pH 6.73, HCO3 10, PCO2 66. The possible diagnosis is = Mixed acidosis (metabolic and respiratory both)
- COPD patient with acute diarrhea and ABGs showing pH 7.12, CO2 50, and HCO_3 7 has = Mixed acidosis

Other ABG-Related Scenarios

- A pt with severe vomiting and diarrhea for 1 day presented with tachypnea and respiratory rate 22, hypotension. Labs showed hypochloremia, hyponatremia, and hypokalemia. What is the diagnosis = Metabolic acidosis
    - It also comes as
        - A patient with severe vomiting, diarrhea, and electrolyte imbalance with hypochloremia and hyponatremia has = Metabolic acidosis
- Long scenario, but PCO2 will be decreased to compensate for = Metabolic acidosis
- A person breathing into a paper bag. What will cause hyperventilation = Increase arterial CO2
- Blood for Arterial pH is taken from = Arterial blood in heparinized tube

Compensatory Mechanism

- Effect of acidosis on body, body will counteract to it by = Hyperventilation
    - It also comes with different options
        - What is the body response to acidosis = Increase respiration
        - Which of the following is the effect of acidosis on the body = Increased respiration
- The major effect of acidosis on the body is = Depression of central nervous system
- In metabolic acidosis, how is renal compensation done = Inc. Glutamine absorption
    - Do not change the key to glutamine secretion
    - The kidneys absorb more glutamine from the bloodstream, facilitating its breakdown to ammonium and bicarbonate.
    - In metabolic acidosis, the kidneys break down glutamine into ammonium ($NH4^+$) and bicarbonate ($HCO3^-$).
    - Ammonium ($NH4^+$) is excreted in the urine to remove excess H^+ ions.
    - Bicarbonate ($HCO3^-$) is reabsorbed into the blood to buffer the acidosis.
- Metabolic acidosis regulation of kidneys is by = H+ loss
    - It is also asked as
        - During chronic metabolic acidosis caused by persistent diarrhea, the condition that does NOT occur is = The urinary pH will be increased

- Note= In metabolic acidosis, urinary pH decreases because the kidneys excrete more H^+ ions

- Renal correction of acute hyperkalemia will result in = Acidosis
- The vital renal defense against respiratory alkalosis is = Increased secretion of NaHCO3
- Volatile acid compensation = Bicarbonate system of kidney
- Metabolic acidosis is associated with = Hyperkalemia
- In a diabetic patient, acidosis is produced due to = Decreased HCO3
- Decreased HCO3 is associated with = Metabolic acidosis

185. ANION GAP = DIFF BETWEEN MEASURED CATION AND MEASURED ANION

Note the formula:

- Anion Gap (without K) = Na - (Cl + HCO3)
- Anion Gap (with K) = (Na + K) - (Cl + HCO3)

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Calculate the anion gap HCO3 15, Na 135, Cl 100 and K+4= Answer 24
    - How to solve
        - ✓ As we know that: (Na + K) - (Cl + HCO3)
        - ✓ Putting values= (135 + 4) – (100 + 15)
        - ✓ = 139 - 115
        - ✓ Answer: 24
- Also remember that in diarrhea = Metabolic acidosis with normal anion gap occurs
- Severe diarrhea= Metabolic acidosis with normal anion gap
- A patient with severe diarrhea may develop = Metabolic acidosis with normal anion gap

186. RESPIRATORY ACIDOSIS CAUSE= BARBITURATES POISONING

IMPORTANT CAUSES OF ACIDOSIS AND ALKALOSIS

- Metabolic Acidosis

↑ Anion gap > 12 mEq/L	Normal anion gap 8–12 mEq/L
MUDPILES:	C-HARDASS:
Methanol (formic acid)	Carbonic anhydrase inhibitor
Uremia	Hyperalimentation
Diabetic ketoacidosis	Addison disease
Propylene glycol	Renal tubular acidosis
Iron tablets or INH	Diarrhea
Lactic acidosis	Acetazolamide
Ethylene glycol	Spironolactone
Salicylates (late)	Saline infusion

Metabolic Alkalosis	Respiratory Acidosis	Respiratory Alkalosis
Loop diuretics	Airway obstruction	Hysteria
Vomiting (hyperemesis gravidarum)	Acute lung disease	Hypoxemia (e.g., high altitude)
Antacid use	Chronic lung disease	Salicylates (early)
Conn's syndrome (Primary Hyperaldosteronism)	Opioids, sedatives	Tumor
	Weakening of respiratory muscles	Pulmonary embolism

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

METABOLIC ACIDOSIS

- Which of the following occurs in severe diarrhea= Hyponatremia (no option of metabolic acidosis)
    - It is also asked as
        - In severe diarrhea, what happens to electrolytes in the body= Decreased Na+
        - A 39-year-old patient suffering from severe diarrhea characteristically has= Deceased sodium content of body
- Metabolic acidosis is due to = Excessive use of carbonic anhydrase inhibitor
    - It also comes as
        - Acidosis with normal anion gap = Carbonic anhydrase inhibitor
        - Hyperchloremic metabolic acidosis = Acetazolamide
- Regarding Muscle fatigue will lead to = Lactic acidosis
- Which drug should be stopped 24 hours before surgery to prevent lactic acidosis = Metformin
    - It is also asked as
        - The anti-hyperglycemic drug that can lead to lactic acidosis if not stopped before surgery is? = Metformin
- Which of these can cause acidosis = Diabetes

METABOLIC ALKALOSIS

- Hypokalemic metabolic alkalosis along with expansion of extracellular fluid volume is seen due to = Conn's syndrome
- Metabolic alkalosis caused by? = CRF
- A pregnant lady presented to you with hyperemesis gravidarum and Alkalosis. Which electrolyte abnormality is she likely to have = Hypokalemia
    - It also comes as
        - Hyperemesis gravidarum along with hypokalemia = Metabolic alkalosis
        - Hyper emesis gravidum, metabolic alkalosis. What is the outcome = Hypokalemia
- A 25-year-old woman is admitted to the hospital with a 4 months history of malaise and generalized muscle cramps. Laboratory investigations reveal serum sodium = 145 mmol/L, serum potassium = 2.0 mmol/L, serum bicarbonate = 40 mmol/L, and arterial pH = 7.5. The most likely cause of this patient's hypokalemia and alkalosis would be = hyperaldosteronism.
- Metabolic alkalosis occurs in = Hyperaldosteronism
- Drug causing Metabolic alkalosis = Thiazide

RESPIRATORY ALKALOSIS AND ACIDOSIS

- Which of the following is a common cause of respiratory alkalosis= High altitude
- Respiratory acidosis occurs in body during = Drowning
- Asthma causes = Respiratory acidosis

KNOW THE DIFFERENCE:

- Hyperchloremic metabolic acidosis - Acetazolamide
- Hypochloremic Metabolic Alkalosis - Thiazide and Loop

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187. A PATIENT AFTER TAKING AN ANALGESIC OVERDOSE EXPERIENCED HYPERVENTILATION TACHYCARDIA AND METABOLIC ACIDOSIS. THE MOST LIKELY DRUG IS = ACETYL SALICYLIC

KNOW THIS

- Early stage: Respiratory alkalosis (due to hyperventilation).
- Late stage: Metabolic acidosis (due to salicylate accumulation and lactic acid production).

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Aspirin overdose results in = Alkalosis
- Aspirin overdose causes? = Respiratory alkalosis

- ❖ A 30-year-old patient was brought to the medical emergency with the symptoms of nausea, vomiting, hyperventilation, and acidosis. There was a history of analgesic overdoses. The analgesic most likely is = Salicylates
- ❖ A patient after taking an analgesic overdose experienced hyperventilation, tachycardia, and metabolic acidosis. The most likely drug is = Acetylsalicylic

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188. IN DIABETIC NEPHROPATHY, WHAT WILL BE INDICATE THAT NEPHROPATHY HAS OCCURRED= MICRO ALBUMINURIA

REMEMBER ABOUT NEPHROTIC AND NEPHRITIC SYNDROME

<table>
<tr><td>Minimal change disease</td><td>❖ Most common cause of Nephrotic syndrome in children
❖ Excellent response to corticosteroids
❖ Selective proteinuria</td></tr>
<tr><td>Membranous glomerulonephritis</td><td>❖ Most common cause of Nephrotic syndrome in adults
❖ Poor response to corticosteroids</td></tr>
<tr><td>Focal segmental glomerulosclerosis</td><td>❖ It is more common in African Americans and is associated with HIV.</td></tr>
<tr><td>Diabetic nephropathy</td><td>❖ Kimmelstiel-Wilson nodules
❖ Diagnostic test----urine albumin</td></tr>
<tr><td>Renal Amyloidosis</td><td>❖ Amyloidosis refers to accumulation of insoluble fibrillar proteins that form β-pleated sheaths, two types
❖ Light Microscopy—Congo red stain shows apple-green birefringence</td></tr>
<tr><td>Acute post streptococcal glomerulonephritis</td><td>❖ Most common type of post-infectious glomerulonephritis in children's
❖ Occurs 1–4 weeks after a sore throat caused by group A β-hemolytic streptococci i.e. streptococcus pyogenes
❖ Sudden onset of fever, oliguria, hematuria (cocoa-colored urine)
❖ Serum C3 decreased, ASO titers elevated</td></tr>
<tr><td>Rapidly progressive (crescentic) glomerulonephritis</td><td>❖ Crescent shape glomerulonephritis
❖ Disease processes that may result in this pattern are
<table>
<tr><th>Goodpasture syndrome</th><th>Wegener's glomerulonephritis</th></tr>
<tr><td>o Antibodies against GBM and alveolar basement membrane
o IgG deposits on renal biopsy</td><td>o It is necrotizing medium sized small vessel vascultitis</td></tr>
<tr><td>o Involves lung and renal vessels</td><td>o Involving upper respiratory tract, lung and renal vessels</td></tr>
</table>
❖</td></tr>
<tr><td>IgA nephropathy (Berger disease)</td><td>❖ It presents with recurrent episodes of hematuria following upper RTI, GI infections, occurs 1-2 days after infection</td></tr>
<tr><td>Alport syndrome</td><td>❖ Due to abnormal collagen type IV
❖ Clinical features: Mnemonic: "can't see, can't pee, and can't hear a bee."
o Eye problems (e.g., retinopathy, lens dislocation)
o Glomerulonephritis
o Sensorineural deafness</td></tr>
</table>

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ The microscopic findings of Minimal change disease are = Effacement of podocyte foot processes
  - o It also comes as
    - ▪ Features of minimal change disease = Proteinuria >3.5g/day
    - ▪ Minimal change disease of kidney = Proteinuria

    - Selective proteinuria occurs in which of the following diseases = Minimal change disease
    - Proteinuria in a child that improves with steroids is due to = Fusion of foot processes
- A 14-year-old boy had acute onset of fever and sore throat. He probably has = Post streptococcal glomerulonephritis
  - It also comes as
    - Child with post-strep sore throat develops edema, hematuria, hypertension. Diagnosis? = Acute post-streptococcal glomerulonephritis
    - A 7 years old school-going boy develops a sore throat. He received antibiotics for it, which resolved it, following 2 weeks later he developed generalized body edema, hypertension, and hematuria. The most likely diagnosis is = Acute post-streptococcal glomerulonephritis
    - A 4-year-old boy is brought in by his mother after she discovers that his urine is now a dark Coca-Cola color. He reports that he saw a doctor 10 days ago because he was complaining of a sore throat, but he has otherwise been well. What is the most likely diagnosis = post-streptococcal glomerulonephritis
    - Young girl with shortness of breath. Pitting edema. Edema of eyelids. Had severe throat infections a few weeks back. What is the cause = PSGN
- Crescent formation is the characteristic of which of the following glomerular diseases = Rapidly progressive glomerulonephritis
  - It is also asked as
    - Scenario of nephritic syndrome, microscopy shows Crescent in basement membrane. Diagnosis = RPGN (Rapidly progressive glomerulonephritis)
- In certain pathologies, Crescents in glomeruli are formed by = Parietal cells
  - It also comes as with different options
    - Crescents formation in kidney is most closely associated with= Fibrin leakage
- A patient has hemoptysis, hematuria & glomerulonephritis. The most probable diagnosis is = Goodpasture Syndrome
- A 30yr old female with saddle nose, granulomatous perforating lesion of nasal septum, vasculitis & proteinuria. The most likely lesion is=Wegener granulomatosis
  - It also comes as
    - Pt presents with hematuria, haemoptysis and nasal lesion. Likely diagnosis is=Wegener granuloma
    - A 31-year-old female had a necrotic lesion in the nose. The urine examination of the patient revealed proteinuria. The biopsy showed granulomata with necrosis and vasculitis. The most likely diagnosis in this case is = Wegener's granulomatosis
- In diabetic nephropathy, what will indicate that nephropathy has occurred = Urinary Microalbuminuria
  - It also comes as
    - Diagnostic test for diabetic nephropathy is = Microalbuminuria
- A 60-year-old man known case of diabetes for the last 20 years now presented with rapidly progressive renal failure. The most likely feature in this patient would be = Kimmelstiel-Wilson nodules
- A renal biopsy examination shows a granular pattern of immunofluorescence staining with an antibody to complement component C1q and splitting of the basement membrane. This pattern is associated with = Membranoproliferative glomerulonephritis type 2
- A patient with high BP and decreased complement levels likely has = Sclerosing glomerulonephritis
- Most common glomerular disease in HIV patients is = Focal segmental glomerulosclerosis
- A 15-year-old boy suffering from a renal disease that affects the males in his family presents with hematuria. He also has a vestibular nerve defect causing deafness and corneal dystrophy. Urine examination shows protein 1+. Renal biopsy on EM reveals GBM attenuation, with splitting and lamination of lamina densa. The most probable diagnosis is = Alport syndrome
- Lambda light chain deposits by immunofluorescence is most closely associated with = Amyloidosis
  - It is also asked as
    - A patient with amyloidosis is found to have a plasma cell disorder. Which is the most likely type of protein responsible for his amyloidosis? = Amyloid light chain protein

- Diagnosis of Amyloidosis is made by=Rectal biopsy
- Amyloidosis most commonly affects which organ=Kidney
- A 5 years' child presented with generalized edema. Investigation of choice should be=Urine protein
- An adult with generalized edema and urinary protein 6gm. Damage is done to=Basement membrane
- In a case of nephrotic syndrome, the most likely cause of oedema feet is= Hypoproteinemia
  - It also comes as with different options
    - The most common cause of oedema in nephrotic syndrome is=Hypoalbuminemia
    - A 4 yr boy presents with periorbital edema Mechanism of edema is=Hypoalbuminemia with salt retention
- Movement of fluid through the capillary wall between the blood and interstitial spaces is controlled by the plasma = Albumin
- A child who is Apathic, has edema and skin lesion. The cause of edema is decrease levels of=Albumin
- The primary force moving water molecules from the blood plasma to the interstitial fluid is = Filtration
- A female with purpura, proteinuria, dry mouth, and burning sensation in hands and feet likely has = Mixed cryoglobulinemia
- Patient's CHF is worsening. What is the cause= Na and H2O retention

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189. GOOD PASTURE SYNDROME= LINEAR DEPOSITION

REMEMBER

- Selective proteinuria= Minimal change disease
- IgA nephropathy= Mesangial deposits in glomerular basement membrane
- IgM and C3 deposits in= FSGS (focal segmental glomeroloscelorosis)—associated with HIV
- Linear deposits= Goodpasture syndrome
- Subepithelial deposits/humps= post streptococcal GN
- Subendothelial deposits = SLE and Membranoproliferative glomerulonephritis (MPGN) type-1
- Spike and Dome are seen in = Membranous glomerulonephritis – (associated with SLE, Hep B)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Finding in post streptococcal glomerulonephritis is? = Subepithelial deposits
  - It also comes as
    - Post streptococcal glomerulus-nephropathy scenario = Subepithelial deposits
    - The most characteristic feature of post-streptococcal glomerulonephritis is: = Subepithelial deposits
- Selective proteinuria occurs in which of the following diseases = Minimal change disease
- A 7-year-old child was brought to the physician with the condition of periorbital edema and lethargy. On investigation, he was having massive proteinuria on Urine R/E. Which of the following features on Electron Microscopy will confirm the suspected diagnosis? = Effacement of foot processes (A case of minimal change disease)
- In IgA nephropathy, the histopathological report will be consistent with = Increased mesangial matrix
  - It is also asked as
    - IgA nephropathy = Mesangial deposits in glomerular basement membrane
- Nephrotic syndrome. Basement membrane damage will lead to = Hypoalbuminemia
- Proteins normally don't leak out in tubular fluid due to endothelium is fenestrated = Basement membrane is negatively charged
- 46 years male presented with nephrotic syndrome. Immunofluorescence microscope of renal biopsy showed sclerosis with deposition of IgM and C3. What is the most likely diagnosis= Focal segmental glomerulosclerosis
- Focal segmental glomerulosclerosis is characterized by= Massive proteinuria
- Goodpasture's syndrome is closely associated with= Peripheral linear IgG deposits by immunofluorescence

190. PROTEINURIA IS DUE TO=GLOMERULAR BASEMENT MEMBRANE DAMAGE

FEW IMPORTANT MCQS

- Proteinuria occurs due to damage in = Glomerular basement membrane
    - It also comes as
        - A child having 6g/dl proteinuria, where will be the defect = Basement membrane
        - A young patient with generalized edema and proteinuria of 6 g/day presents in the outpatient department. The renal structure most likely damaged is = Basement membrane
- Albumin, RBC cast, and cells in urine, possible site of damage = Glomerulus
- Proteins cannot pass through basement membrane due to which characteristic of protein = Negative charge
    - It is also asked as
        - Albumin does not get freely filtered in glomeruli due to = Negative charge of particle
        - Albumin not filtered from the basement membrane due to = Negative charge
        - A patient has renal problem with proteins in urine, which of the following mechanisms normally prevents these proteins from coming out in urine = Negative charge on membrane pores
- Negative charge of basement membrane is due to = Heparin sulphate
    - Note: Heparin sulphate > Proteoglycans > Laminin
- Regarding histology of normal kidney = Podocyte on visceral layer of Bowman capsule
- The capillary pressure in renal glomeruli is = Increases as cardiac output increases
- Regarding glomerular capillary pressure = Decrease by 10% when BP decreases by 10%

191. COMMONEST ORGANISM CAUSING UTI = E. COLI

NOTE IN ORDER OF MOST COMMON CAUSE OF UTI

- ✓ E coli (most common).
- ✓ Staphylococcus saprophyticus—seen in sexually active young women (E coli is still more common in this group).
- ✓ Klebsiella.
- ✓ Proteus mirabilis—urine has ammonia scent.

ACUTE PYELONEPHRITIS

- Pathology: Neutrophil infiltration in renal interstitium, spares glomeruli/vessels.
- Causes: Ascending UTI (E. coli most common).
- Risk factors: DM, pregnancy, catheter, obstruction.
- Complications: Chronic pyelonephritis, papillary necrosis, abscess, urosepsis.

NOW SOME PAST PAPER MCQ'S

URINARY TRACT INFECTIONS (UTI)

- Gram negative organism can cause septic shock after infection in which tract = Urinary tract
- Most common organism causing UTI is = E. coli
- The most common lactose fermenting gram negative organism causing UTI is = E. coli
    - It also comes as
        - UTI scenario gram negative rod = E. coli
- UTI case with gram-negative motile rods, urease +ve, lactose non-fermenting organism? = Proteus mirabilis
- Female patient with increased frequency and urgency diagnosed as UTI. Microscopy shows gram-negative motile rods, with swarming motility on agar, likely organism is = Proteus mirabilis
    - It is also asked as
        - Organism with swarming motility on agar causing UTI? = Proteus mirabilis
- 70-year-old man with frequent complaints of UTI. Cause = Obstruction to urine flow

- Lady with 12-week amenorrhea presents with increased frequency, burning of micturition along with a high-grade fever. The most probable diagnosis is = UTI
  - It also comes as
    - Pregnant lady with increased frequency and burning of micturition along with high-grade fever. The most probable diagnosis is = UTI
- A person with a UTI caused by oxidase-positive, non-lactose fermenting organism likely has = Pseudomonas infection
- A person developed urine infection. Urine culture plate yielded a greenish growth having fruity smell. This organism was oxidase positive and non-lactose fermenting. The most appropriate drug in this case would be= Ciprofloxacin (Prefer Ciprofloxacin over ceftazidime)
- Female has burning pain during urination etc. She is diagnosed with having UTI. The organism on culture is identified as oxidase positive, non-lactose fermenting, greenish color, and fruity smell. Likely agent is= Pseudomonas
- A 26-year sexually active female presented with burning micturition and abdominal pain. Investigation confirmed UTI caused by a gram-positive organism. This could likely be caused by = Saprophyticus

ACUTE AND CHRONIC PYELONEPHRITIS

- Common cause of acute pyelonephritis = E. Coli
- Long scenario of newly wed female with fever and pain at adnexa and suprapubic tenderness. Her labs showed raised lymphocytes >15000. Organism involved = E. coli
- A 30-year female presented with rigors and chills, high-grade fever, and not responding to treatment for more than 2 weeks. USG shows renal parenchymal changes. The diagnosis is = Acute pyelonephritis
- A 20-year-old female with fever, lumbar pain, pus in urine, no response to antibiotics. Likely diagnosis = Acute pyelonephritis
- The most common infectious agent associated with chronic pyelonephritis is = Escherichia coli

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192. A 10 YEARS OLD CHILD DIED. AUTOPSY WAS PERFORMED WHICH WAS OTHERWISE NORMAL EXCEPT NUMEROUS CYSTS IN KIDNEY AND LIVER. PATTERN OF INHERITANCE OF THIS DISEASE IS=AUTOSOMAL RECESSIVE

KNOW THE DIFFERENCE

	Autosomal Dominant Polycystic Kidney Disease	Autosomal Recessive Polycystic Kidney Disease
Definition	❖ Autosomal dominant, in which renal parenchyma is replaced by cyst	❖ Autosomal Recessive Cystic dilation of collecting ducts.
Presentation	❖ Manifests between 15 and 30 years of age, even though the genetic defect is present at birth.	❖ Often presents in infancy.
Associated with	❖ Liver cysts (70%), Berry aneurysms of the circle of Willis (8%) ❖ Cardiovascular system: MVP, aortic dilation and dissection	❖ Congenital hepatic fibrosis. ❖ Significant oliguric renal failure in utero can lead to Potter sequence

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Mode of inheritance of adult polycystic kidney is = Autosomal dominant
  - It is also asked as
    - Adult polycystic disease of the kidney Is familial. Both males and females are involved in every generation. 50% of every generation are unaffected and do not transmit the trait to their offspring. This disease is inherited as = Autosomal dominant trait

    - In the transmission of adult polycystic kidney disease, one of the following statements is correct = It is an autosomal dominant disorder
    - Pattern of inheritance of adult polycystic kidney = Autosomal dominant
- ADPKD is associated with = Subarachnoid hemorrhage
  - It also comes as
    - Adult polycystic kidney disease is most closely associated with = Cerebral hemorrhage
- ADPKD is caused by mutations in the PKD1 gene located on which chromosome = Chromosome 16
- Mode of inheritance of childhood polycystic kidney is = Autosomal recessive
  - It is also asked as
    - Inheritance pattern in childhood polycystic kidney where 50% of the generation is not affected = Autosomal recessive
    - A 10-year-old child died. Autopsy was performed which was otherwise normal except numerous cysts in kidney and liver. Pattern of inheritance of this disease is = Autosomal recessive
- A 30-year-old male died suddenly after a sudden rise in blood pressure. At autopsy, the ruptured vessel completely lacks the tunica media at the point of an aneurysm. The most likely aneurysm is = Berry aneurysm

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193. TYPE 2 TUBULAR ACIDOSIS DUE TO= DEFECT IN HCO_3 REABSORPTION

- Note about Renal Tubular Acidosis→ A disorder of the renal tubules that leads to **normal anion gap (hyperchloremic) metabolic acidosis**

	Distal renal tubular acidosis (type 1)	**Proximal renal tubular acidosis (type 2)**	**Hyperkalemic renal tubular acidosis (type 4)**
Defect	Defect in ability of a intercalated cells to secrete H^+ → no new HCO_3	Defect in PCT HCO_3 reabsorption	↓aldosterone production→hyperkalemia →↓ NH_3 synthesis in PCT →↓ NH_4^+ excretion
Urine pH	> 5.5	< 5.5.	< 5.5.
Serum K^+	Hypokalemia	Hypokalemia	Hyperkalemia
Causes	Amphotericin B toxicity congenital anomalies (obstruction) of urinary tract	**Fanconi syndrome** and carbonic anhydrase inhibitors	Diabetes, ACE inhibitors, ARBs, NSAIDs

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Urine pH >5, despite low plasma NH_3, type of acidosis = RTA-1 (Distal Renal Tubular Acidosis)
- Inability to produce a urine pH less than 5.4 even when challenged with ammonium is found in = Distal renal tubular acidosis (type-1)
- A patient is suffering from renal tubular acidosis, his urine pH is 5.4. The patient urine cannot be made alkaline even by giving Bicarbonate. Which type of RTA it is? = Type 1
- Type 2 tubular acidosis is due to = Defect in HCO_3 reabsorption
- A 3-month-old baby presented in a critically ill condition. pH: 7.2, PCO_2: 32, HCO_3: 14, Na: 142, K: 2.5. Diagnosis? = Renal tubular acidosis
- 4-month-old child in ER with acidic pH, Na 145, and potassium 2.5. Diagnosis = Renal tubular necrosis
- Acute tubular necrosis type 4 feature = Hyperkalemia
- Cause of Vit D resistant rickets is= Fanconi syndrome
- In Fanconi syndrome, decrease ATP at the PCT is linked with= Glycosuria
- The characteristic feature of Fanconi syndrome is= Glycosuria

- Autosomal recessive disorders like Fanconi anemia, Ataxia telangiectasia are labelled as 'chromosome breakage syndrome' this means= Defective DNA repair
- Most likely regarding acute tubular acidosis = Hypokalemia
  - Acidosis usually associated with Hyperkalemia
  - But Renal Tubular acidosis is associated with Hypokalemia (Type 1 & 2)
  - Only Type 4 Renal tubular acidosis is with Hyperkalemia

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194. A 30-YEAR LADY OTHERWISE NORMAL WITH HIGH PTH, LOW CA, HIGH PO4, AND NORMAL ALKALINE PHOSPHATE. WHAT IS DIAGNOSIS? = CHRONIC RENAL FAILURE

Acute Kidney Injury (AK I)

- Definition: Acute, reversible renal dysfunction (↑ creatinine/BUN, oliguria).
- Causes:
  - Prerenal: Hypovolemia, HF, renal artery stenosis.
  - Intrinsic: ATN, glomerulonephritis, interstitial nephritis.
  - Postrenal: Obstruction (stones, tumors, prostate).

Chronic Kidney Disease (CKD)

- Definition: GFR <60 or kidney damage >3 months.
- Causes:
  - Inherited: Polycystic kidney disease, Alport syndrome.
  - Acquired: DM, HTN, pyelonephritis, glomerulonephritis.

Labs:

- Hb: Normochromic, normocytic anemia.
- Calcium/Phosphate: $\downarrow Ca^{2+}$, $\uparrow PO_4^{3-}$, ↑alk phos (osteodystrophy).
- PTH: ↑PTH (CKD Stage 3+).

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Laboratory investigations of a 35-year-old female show: Low total and ionized serum calcium, high serum phosphate, high serum parathyroid hormone concentration, and normal alkaline phosphatase. She is most likely suffering from = Chronic renal failure
- In chronic renal failure, the most likely change = Phosphate level rises
  - It also comes as
    - Consistently present finding in chronic renal failure? = Hyperphosphatemia
    - In chronic renal failure most likely = Phosphate level rises
    - A hypertensive patient has been diagnosed with chronic renal failure. The change most unlikely to be present in him will be = Hypophosphatemia.
- Vitamin D formation decreases in = Chronic renal failure
- Disease where 25 cholecalciferol is not converted to 1,25 cholecalciferol? = Renal failure
- In chronic renal failure, the most likely cause of shortness of breath is = Metabolic acidosis
- A 59-year-old female known hypertensive on medication, brought in a semi-collapsed state. Her K = 6.1. The most likely cause in this patient is = Acute Renal Failure
- After 6 months of renal transplant, the patient presents with signs of renal failure. His symptoms are resolved by giving immunosuppressive therapy. What is the likely cause? = Acute cellular rejection
- A patient presented with renal failure symptoms and a deranged BUN/Creatinine Ratio > 20 with BUN greater than creatinine likely has = pre-renal azotemia
- In chronic renal failure (equivalent to a reduction in the total number of nephrons): = Plasma PCO2 tends to be low
- Which condition causes decreased potassium excretion? = Renal failure
- Decreased reticulocytes are seen in = Chronic renal failure.
- One of the following antibiotics is contraindicated in a patient with renal failure = Gentamycin
- Least nephrotoxic used in infant with renal failure = Neomycin

- Pararenal fascia is an extension of = Renal fascia
- In a chronic CRF patient on dialysis for 20 years, autopsy would most likely show hypertrophy of the = PTH gland
- The X-ray lower limb of an old diabetic/CKD-on dialysis patient shows loss of trabecular bone from the femur head. Which hormone is responsible for such finding? = PTH

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195. WHAT IS THE BEST WAY TO CALCULATE GFR CLINICALLY IN A CKD PT AWAITING DECISION BETWEEN TRANSPLANT AND DIALYSIS=CREATININE CLEARANCE

NOTE THE FOLLOWING ABOUT DIALYSIS

- A chronic CRF patient on dialysis. Most probable autopsy finding will be = Hypertrophied PTH gland
    - It is also asked as
        - In a chronic CRF patient on dialysis for 20 years, autopsy would most likely show hypertrophy of the = PTH gland
- Patient has ESRD and is on long-term dialysis. Which of the following amyloidosis-related proteins is found? = Beta 2 microglobulin
- Dialysis for maintenance of normal body functions is indicated when the glomerular filtration rate is less than= 20%
- The X-ray lower limb of an old diabetic/CKD-on dialysis patient shows loss of trabecular bone from the femur head. Which hormone is responsible for such finding? = PTH
- Old woman with multiple fractures, hypertensive and is on dialysis. Reason is = Deficiency of Vit D
- Patient on dialysis having oral ulcers due to deficiency of = Vitamin B
    - Note: A significant proportion of ESRD patients have physiological vitamin B12 deficiency, which can lead to mouth ulcers.
- A patient has end-stage renal disease and is on dialysis for 6 months. Has received multiple blood transfusions. Her Hb 8, MCV 86, and low MCH. What type of anemia does she have? = Normocytic hypochromic anemia
- 60-year-old with on-off fever, lethargy, dyspnea on exertion. Hb 7.8, urea 140, creatinine 3 = Erythropoietin deficiency
- A middle-aged known case of ESRD on the list for hemodialysis. He has normochromic anemia. Which is the most appropriate therapy to be given? = IV Erythropoietin
    - Note: The preferred initial form of therapy for anemia of chronic kidney disease is the use of Erythropoiesis-stimulating agents (Ref: CMDT).
- A patient has end-stage renal failure. He is undergoing hemodialysis and has developed normocytic normochromic anemia. The most appropriate therapy would be = Erythropoietin.
    - It is also asked as
        - A patient with end-stage renal failure complains of pallor, fatigability, and lethargy for the past 3 months. Blood tests show Creat 4, Hb 7 with a normal smear. What is the most likely cause of anemia? = Erythropoietin deficiency
        - A pt with end-stage renal failure has had multiple blood transfusions for anemia. Which of the following will be helpful to reduce the number of transfusions? = Subcutaneous Erythropoietin

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196. A CHEMICAL FACTORY WORKER WAS DIAGNOSED WITH TRANSITIONAL CELL CARCINOMA OF BLADDER WHAT IS THE LIKELY CAUSE = ANILINE DYE

TRANSITIONAL CELL CARCINOMA

- Most common tumor of the urinary tract system.
- Key feature: Painless hematuria (no casts).
- Associations (Mnemonic: **Pee SAC**): **P**henacetin, **S**moking, **A**niline dyes, **C**yclophosphamide.

SQUAMOUS CELL CARCINOMA (SCC) OF THE BLADDER

- Pathogenesis: Chronic irritation → Squamous metaplasia → Dysplasia → SCC.

- Risk factors: Schistosoma haematobium infection (S for Squamous cell carcinoma= S for Schistosoma haematobium), Smoking, Chronic nephrolithiasis.
- Presentation: Painless hematuria.

RENAL CELL CARCINOMA (RCC)

- Origin: Proximal convoluted tubule (PCT) cells.
- Genetic Association: Chromosome 3 deletion (RCC = 3 letters = Chromosome 3).
- Features:
  - Classic triad: Flank pain, palpable mass, hematuria.
  - Fever, secondary polycythemia.
  - Paraneoplastic syndromes (ectopic EPO, ACTH, PTHrP, renin).

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- A middle-aged man came back from Cairo & developed painless hematuria. Likely diagnosis is= Squamous cell carcinoma of the urinary bladder (Cairo is the capital of Egypt and is endemic for schistosomiasis which causes SCC of the urinary bladder)
  - It is also asked as
    - A 50-year-old man from Cairo presented with hematuria. Cystoscopy showed a tumor mass. On histopathological examination, the most likely diagnosis would be = Squamous cell carcinoma
- Squamous cell carcinoma of the bladder with a history of granulomatous bladder lesions is caused by = Schistosomiasis
  - It is also asked as
    - The parasite associated with urinary bladder carcinoma is= Schistosoma haematobium
    - Schistosoma haematobium causes= Urinary bladder abnormalities
    - Squamous cell carcinoma of bladder caused by= Schistosoma
    - A 45-year man suffering from hematuria later develops carcinoma of bladder. His urine sample shows the presence of ova with large terminal spine. He is infected by which of following parasite= Schistosoma haematobium
- A chemical factory worker was diagnosed with transitional cell carcinoma of the bladder. What is the likely cause? = Aniline dye
- Which of the following is the most common cause of bladder carcinoma= Smoking
- A chronic smoker from 30 year working in tire factory presented with painless hematuria. Histopathology show transitional cell carcinoma of bladder. Causative agent in his case is= Tobacco smoking
- A 50-year-old man having aching pain in the right flank, hematuria, and weight loss. Blood urea, nitrogen, serum electrolytes, and RFTs were normal. Hb 18 and serum Ca 11. On imaging, there is a mass in the right flank. Diagnosis? = Renal cell carcinoma
- A 60-year-old patient with increased hematocrit and creatinine. Diagnosis = Renal cell carcinoma
- A nephrectomy specimen on cutting shows a circumscribed, well-defined, grey-white color areas near the upper pole. It measures 5 x 3 x 2.5 cm. It has few areas of hemorrhages and cystic/necrotic spaces. Renal vein and ureter are normal. The most likely diagnosis is = Renal cell carcinoma
- Usual route of spread of renal cell carcinoma is through = Renal vein
- A man with decreased urine, hematuria, and a mass in the right flank likely has = Renal cell carcinoma
- The most likely diagnosis for a circumscribed renal mass with variegated appearance is = Renal cell carcinoma
- Biopsy specimen showing Vementin positive, cytokeratin positive and CD45 negative with cells showing spindle shaped cells with Pleomorphism. Which tumor is likely to match these findings=5-year with renal cell Carcinoma
- Paraneoplastic syndrome associated with renal cell carcinoma= Polycythemia

197. **THE MOST SIGNIFICANT FEATURE IN ACUTE TUBULAR NECROSIS IS = HYPERKALEMIA**

SOME REMAINING MCQS OF RENAL DISEASE

- A student was given a drug by a quack for muscle gain. He developed body ache and oliguria. Investigation showed raised Serum Calcium, ALT, and BUN slightly raised with normal urine findings. The likely diagnosis is = Acute tubular necrosis
- A PT took some medicine from a quack for muscle strength, then developed general weakness and oliguria, his urine was pale yellow, urea was slightly high, serum ALT was slightly high, "HB NORMAL" urea raised what's the cause= Acute tubular necrosis
- In ATN (acute tubular necrosis), which part of the nephron is most likely affected? = PCT
- A 3-year-old child with flank pain and unilateral hydronephrosis, most likely cause = Constriction at PUJ
- A long-standing case of urinary incontinence in an elderly man is likely due to = Benign prostatic hyperplasia

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CHAPTER # 7

HAEMATOLOGY

198. PATIENTS FEEL WEAKNESS, FATIGUE AND DYSPNEA. SHE IS PALE, LAB REPORT REVEALS MICROCYTIC HYPOCHROMIC PICTURE. WHICH OF THE FOLLOWING CONDITION IS SHE SUFFERING FROM= IRON DEFICIENCY ANEMIA

IRON DEFICIENCY ANEMIA

- Most common anemia, Dietary iron is absorbed in duodenum. Iron must be reduced i.e. Fe+2
- Ascorbic acid reduces oxidized iron (Fe+3) and is therefore important in iron reabsorption.
- Clinical features:
  - Koilonychias (spoon shaped nails), angular cheilosis, PICA, atrophic glossitis
  - Plummer-Vinson syndrome:
  - Triad of ("Plumbers" **DIE**).
    - **D**ysphagia (Dysphagia for solids only), **I**ron deficiency anemia, and **E**sophageal webs.
- Lab findings:
  - ↓ Serum iron, ↑ TIBC (↑ only in this anemia), ↓ ferritin (best test)

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

IRON DEFICIENCY ANEMIA (IDA): CAUSES, INVESTIGATIONS, AND DIAGNOSIS

- The most likely cause of anemia in a child with a normocytic picture and Hb 6.8 g/dl is = Iron deficiency
- Investigations of an anaemic male patient showed MCV 70 fl, MCH 21 pg, serum iron 0.4 mg/L, TIBC 6mg/L, serum ferritin 15 µg/L. The most likely diagnosis is = Iron deficiency anemia
  - It is also asked as
    - The likely diagnosis for an anemic male with MCV 70 fl, low serum iron, and low ferritin is = Iron deficiency anemia
    - Cause of anemia in a patient with low Hb, high TIBC, and microcytic hypochromic anemia? = Iron deficiency anemia
    - A 6-year-old girl presented with anemia, lethargy, and fatigue. CBC showed MCV & MCH low, Hb 6.8. What is your diagnosis? = Iron deficiency anemia
    - A 19-year-old girl presented to OPD with complaints of easy fatigability, body aches, and lethargy. O/E she is pale and labs show Hb 6.5, MCV 22, and MCHC 26. What's the underlying cause? = Iron deficiency anemia
    - A pt presented to OPD with complaints of easy fatigability, pallor, body aches. Her labs show Hb 6.5, MCV 22, MCHC 26. What's the underline cause = Iron deficiency anemia
    - A woman with spoon-shaped brittle nails, low Hb, and decreased MCV likely has? = Iron deficiency anemia
    - A 26-year-old male presented with weakness and dysphagia. His blood test shows Hb = 6.0 g%, MCV = 68 fl, MCH = 24 pg, and target cells. The most likely condition is = Iron deficiency anemia
- A pregnant lady without any antenatal visits or medication delivers a preterm baby. She is now worried as the baby is listless and has low ferritin levels. This is due to deficiency of? = Iron
- Which of the following is specific in Iron Deficiency Anemia? = Dec Ferritin
  - It also comes as with different options
    - Most imp investigation for IDA = serum ferritin
    - For iron def anemia, best test is = Serum ferritin + ↑ TIBC
    - The optimum test confirming iron deficiency anemia is = Serum ferritin level and TIBC

    - Optimum test for confirming iron deficiency anemia in child with pallor and low Hb = Serum ferritin level and TIBC

- In iron deficiency anemia, there is an increase in = Serum total iron binding capacity (TIBC)
  - It is also asked as
    - Which of the following is specific in Iron Deficiency Anemia? = Inc TIBC
    - Regarding iron status of the pregnant woman, the parameter showing an increase is: = Serum TIBC (total iron-binding capacity)
    - A pt. with Iron Deficiency Anemia. What will be seen in this pt = Increased TIBC

IRON DEFICIENCY ANEMIA (IDA): BLOOD PICTURE

- Microcytic hypochromic anemia will typically occur in = Iron deficiency
  - It is also asked as
    - A patient has hemoglobin 6.0. Blood picture shows target cells and microcytic hypochromic anemia. Patient has fever and dysphagia = Iron deficiency anemia
    - Blood picture in Iron deficiency anemia = Microcytic hypochromic
    - Scenario with an 8-year-old girl with microcytic hypochromic anemia. Diagnosis = Iron deficiency
- A Primigravida in her last trimester comes with hypochromic, microcytic anemia blood picture. What treatment should be given? = Iron

IRON DEFICIENCY ANEMIA (IDA): RISK FACTORS AND SCENARIOS

- The most likely cause of anemia in a child with hookworm infection is = Iron deficiency anemia
- A 5-year-old girl with pallor, lethargy, fatigue, and a history of eating mud should be treated with = Iron supplements
  - It is also asked as
    - A child presented with microcytic hypochromic anemia and was diagnosed with PICA. The treatment you would give to him = Iron supplements
    - 5-year girl presented with pallor, lethargy and fatigue. CBC showed microcytic anemia. The mother gives history of her daughter eating mud regularly. What is your diagnosis= Iron deficiency anemia
    - 25-year gravida 4 presents with weakness and occult blood in stools = IDA
    - Iron is stored in the form of? = Ferritin
- A patient has Hb 6, platelet 450,000 with hypercellular bone marrow. The diagnosis is = Iron deficiency anemia
- To differentiate iron deficiency anemia from beta thalassemia, the test is= HBA2
- The type of anemia that occurs after partial gastrectomy is = Iron deficiency anemia
- A 34-year-old primigravida in her 8th month of gestation is most likely to have = Iron deficiency
- Daily requirements of iron in an adult female is? = 2g
- Iron absorption best increases with = With citrus fruits
  - It also comes as
    - All of the following are responsible for delayed absorption of Iron except= Vit C
- A primary gravida taking iron tablets and increased intake of fresh vegetables and fruits. What deficiency is she at risk of developing = Calcium
- Ferrous form of iron = Hemoglobin
- Iron present in its ferrous form in = Transferrin
  - It also comes as
    - Iron transport in body is carried out by = Transferrin
- Most important component in iron homeostasis = Hepcidin
- Iron absorption from the intestine is increased by = Ferrous form
- Scenario in which there was RBC slide in which they show thin streak of iron = Hypochromic and microcytic

- The component of salivary secretion that exerts an antibacterial action by depriving microorganisms of iron is = Lactoferrin
- Baseline nutritional status assessment involves = Serum albumen and total iron binding capacity
- Iron requirement in a pregnant female is = 1000mg
- Total body iron content in an adult woman is about = 2 gm
- A patient has an end stage renal disease and is on dialysis for 6 months. Has received multiple blood transfusion. Her HB 8, MCV 86 and low MCH. What type of anemia does she have= Normocytic hypochromic anemia
    - For renal disease patient
    - MCV= microcytic, macrocytic or normocytic
    - While MCH= normochromic, hypochromic or hyperchromic .
    - It also comes as
        - A patient has end-stage renal disease and is on dialysis for 6 months. Has received multiple blood transfusions. Her HB 8, MCV 86, and low MCH. What type of anemia does she have = Normocytic hypochromic anemia
        - - A patient of chronic renal failure on dialysis has Hb 9.0mg/dl, MCV 89, MCHC, and Hematocrit also in normal range. Which type of anemia = Normocytic normochromic anemia
        - - Young Patient has dyspnoea and anaemic symptoms. MCV 100, MCHC 30, Hb 9. What is the type of anemia = Normocytic Normochromic

KNOW THE DIFFERENCE:

- A 29-year female presents with lethargy and irritability for the last 5 years. Labs revealed Hb of 9.6, MCV 70 and MCHC low with normal WBC and PLT count. She was prescribed Iron supplements yet after 2 months she has Hb 10. Which lab investigation should be ordered to find the underlying cause of persistent anemia=HB electrophoresis
- Patient with IDA was given iron supplements to monitor the response= Serum ferritin.

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199. IN IRON DEF ANEMIA, INCREASED = TIBC

- Note that Iron def. anemia is the only type of anemia in which TIBC is increased

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200. A LADY AFTER SURGERY WITH ACUTE BLOOD LOSS. WHICH TYPE OF ANEMIA WILL BE PRESENT. = NORMOCYTIC NORMOCHROMIC ANEMIA

KNOW THE DIFFERENCE

- ✓ Acute blood loss---- normocytic normochromic
- ✓ Chronic blood loss—initially normocytic normochromic, later on microcytic hypochromic anemia (iron deficiency anemia) — (Reference pathoma)

NOW LET'S PRACTICE SOME PAST PAPER MCQS

- A boy had RTA and suddenly lost 1.5 liters of blood. What will be seen on peripheral picture= normocytic normochromic anemia
    - It also comes as
        - 40 years pt got traffic accident and he lost some blood what anemia he may have= Normocytic normochromic anemia
        - A boy while crossing the road was hit by a car and lost 1.5L of blood during the first hour. What type of anemia will be seen on peripheral smear= Normocytic normochromic
- Small amount of blood loss occurring over a period of time results in which type of anemia = Microcytic hypochromic
- Normocytic, normochromic, normal MCV occurs in which condition = Acute blood loss after 2 days
- A patient with recent blood loss will show= Normal MCV

201. A CHILD WITH RECURRENT TRANSFUSIONS AND ENLARGED SPLEEN. HIS HB IS 5.6 AND HEMATOCRIT 12%. THE MOST PROBABLE DIAGNOSIS IS = THALASSEMIA MAJOR

α-THALASSEMIA

- Inheritance: Autosomal recessive.
- Pathophysiology: ↓ synthesis of α-globin chains → relative excess of β-chains, caused by gene deletions
- Types:
  - Silent Carrier: Genotype: (-/α α/α).
  - Alpha-Thalassemia Trait: Genotype: (-/- α/α).
  - HbH Disease: Genotype: (-/- -/α), Precipitation of β-chain tetramers (HbH); severe anemia.
  - Hydrops Fetalis: Genotype: (-/- -/-), Most severe form; incompatible with life, Hb Barts: Precipitation of γ-chain tetramers.

Β-THALASSEMIA

- Inheritance: Autosomal recessive.
- Pathophysiology: ↓ synthesis of β-globin chains → relative excess of α-chains.
- Genetics: pint mutations, β-chains are expressed only post-natally → anemia 6–9 months after birth.
- Types:
- β-Thalassemia Minor (Heterozygote):
  - Genotype: β^0/β or β^+/β. Features: Mild anemia; protection against falciparum malaria.
  - Diagnosis: ↑ HbA2 on electrophoresis.
- β-Thalassemia Major (Cooley's Anemia): Genotype: β^0/β^0 or β^+/β^+.
  - Severe microcytic anemia, requiring blood transfusions → 2° hemochromatosis.
  - Extramedullary Hematopoiesis: Marrow expansion (crew cut on skull X-ray), Hepatosplenomegaly, ↑ risk of parvovirus B19–induced aplastic crisis.
  - Diagnosis: ↑ HbF (α2γ2).

NOW LET'S PRACTICE SOME PAST PAPER MCQS

THALASSEMIA DIAGNOSIS AND INVESTIGATIONS

- 29 years old woman lethargic, irritable since 5yrs. Hb=9.6g/dl, WBC and Platelet values were normal. Iron therapy given after two months Hb=10.6g/dl. Which investigation will you perform to know the cause of persistent anemia = HB electrophoresis
  - It is also asked as
    - Pt presented with anemia, failure to thrive, pallor, weakness and gives Hx of many transfusions to older brother. Labs showed Hb: 6, MCV 55, microcytic hypochromic anemia. Investigation of choice in this case is = Hb electrophoresis
    - A child presented with splenomegaly and gives family Hx of anemia. His peripheral smear of a pt showed MCV 57, MCH 19, Hb 5. Investigation of choice to be done next is = Hb electrophoresis
    - A 29-year female presents with lethargy and irritability for the last 5 years. Labs revealed Hb of 96, MCV 70, and MCHC low with normal WBC and PLT count. She was prescribed iron supplements yet after 2 months she has Hb 10. Which lab investigation should be ordered to find the underlying cause of persistent anemia = HB electrophoresis
- A 2 years old girl with Hx of failure to thrive, anemia. Hb electrophoresis showed maximum amount of 2 alpha and 2 gamma chains. Diagnosis = Hb F
  - It is also asked as
    - Thalassemia major diagnosed by = Increased HbF
    - The most important factor in the pathogenesis of thalassemia is = Imbalance in the chain ratio
    - Regarding Beta thalassemia = Abnormal beta globin chain synthesis

- Diagnosis for a 2-year-old child with pallor, recurrent transfusions, and enlarged spleen? = Thalassemia major
    - It is also asked as
        - A 2 years old child presented with progressive pallor, HB: 4.9g/dl MCV 56fl, hepatosplenomegaly. Diagnosis = Thalassemia major
        - A child with worsening pallor, hepatomegaly, and Hb 5 mg. The likely cause is = Thalassemia major
        - Boy with Hb 6.5, HbF 97%, palpable spleen. Diagnosis? = Thalassemia major
        - Child having Hb: 5, Retic count 12%, Splenomegaly received multiple transfusions. Diagnosis = Thalassemia major
        - Child got anemia and other brother has history of massive transfusion, what could be the possible diagnosis = Thalassemia
- A 6-year-old girl with complaints of pallor and lethargy. Labs show Hb 5 gm/dl, MCV 58 fl, MCHC 27, platelets 250,000 and TLC count 6200. The likely diagnosis is = Thalassemia Trait
- A young female with 16 weeks of pregnancy is being investigated for anemia. Her labs show Hb 8.1 g/dl, MCV 65 fl, MCH 18.2 pg, HbA 96 %, HbA2 4.0 %. The most likely diagnosis is = B thalassemia trait
- 6 months pregnant last with generalized weakness and lethargy presents with Hb 9.8, MCV 58, MCH 15 and serum ferritin 150 mcg/L. What is the most likely cause of anemia = Thalassemia trait
- A girl with joint and abdominal pain, whose parents are from beta-thalassemia prevalent regions, likely has = Sickle thalassemia syndrome
- A newborn with hydrops fetalis, Hb 8, raised reticulocytes, and blast cells likely has = Alpha Thalassemia

THALASSEMIA COMPLICATIONS AND TREATMENT

- A young girl presents to you with fatigue, lethargy, mild jaundice, skin discoloration and enlarged spleen. Labs showed Hb: 9 with microcytic hypochromic anemia and a ferritin 2000. Next best treatment option is = Deferoxamine
    - It is also asked as
        - Female presented lethargy, pigmentation of body, her HB 8.1, MCV 55, MCHC 35, serum ferritin 1000. Treatment to be given = Deferoxamine
- A Thalassemia child took appointment from dentist for tooth extraction, but two days before that he developed DEEP jaundice, dark urine, Hb 4. Diagnosis = Hemolytic crisis
- Excess iron in thalassemia is stored in the form of = Hemosiderin
    - It is also asked as
        - A 22-year-old woman has a congenital anemia that has required multiple transfusions of RBCs for many years. On physical examination, she now has no significant findings; however, liver function tests show reduced serum albumin. Which of the following findings would most likely appear in a liver biopsy specimen = Hemosiderin in hepatocytes

THALASSEMIA GENETICS AND PREVALENCE

- Point mutation occurs in which of the following = Beta-Thalassemia
- In Pakistan, thalassemia major occurs at a rate of = 5%
    - It is also asked as
        - Carrier frequency for beta thalassemia trait in Pakistan is = 5%
- - A lady having thalassemia trait, planned for pregnancy, comes to you for counselling while her elder child has thalassemia major. The risk of thalassemia in next child is = 25% major, 25% unaffected, 50% trait

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202. WHICH OF THE FOLLOWING PERIPHERAL SMEAR FINDINGS IS ASSOCIATED WITH LEAD POISONING? = BASOPHILIC STIPPLING

MCQS ABOUT LEAD POISONING AND ANEMIA OF CHRONIC DISEASE

- Motor neuron damage due to? = Lead poisoning
- Households with rusty water supply are at risk of = Lead poisoning
- In anemia of chronic disease = Block in the transfer of iron from the mononuclear phagocyte storage pool to erythroid precursors
- An old patient presented to the ER for a fatigue, dyspnea and chest pain which started since yesterday morning. He has been experiencing cough with sputum form many years. Labs show WBC 10,000, Hematocrits 25.4%, Hb 8.4 g/dL, MCV 85 fL, Platelets 154,000 and glucose 124 mg/ dL . The clinical scenario is most consistent with which type of anemia= Anemia of chronic disease

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203. A WOMAN FEELS LETHARGIC FOR 5 MONTHS AND HAS DYSPNEA ON EXERTION, TINGLING SENSATION IN FEET AND DIFFICULTY WALKING. HER HB IS 5.6, WBC 3500, PLATELETS 120,000. DIAGNOSIS= VITAMIN B12 DEFICIENCY

NOTE THE CAUSES OF MACROCYTIC ANEMIA (MCV >100 FL)

- Vitamin B12 (Cobalamin) Deficiency
  - Vitamin B-12 binds with intrinsic factor (produced by parietal cells) then absorbed in terminal ileum.
  - Hypersegmented neutrophils. (more than five lobes)),
  - ↓ Serum B12, ↑ homocysteine, ↑methylmalonic acid
  - Neurological symptoms
    - Posterior column loss → Loss of vibration/proprioception.
    - Corticospinal tract loss → UMN signs.
    - Classic triad: Extensor plantar reflex (UMN), absent ankle jerk (LMN), exaggerated knee jerk.
    - Pain/temperature sensation preserved.
  - Can presents with pancytopenia
- Pernicious Anemia:
  - Autoimmune (Type 2 hypersensitivity) against parietal cells → ↓HCl, ↓intrinsic factor.
- Folate Deficiency Anemia
  - Hypersegmented neutrophils
  - ↑ Homocysteine, normal methylmalonic acid and No Neurological symptoms
- Clinical Pearls:
  - Folate stores deplete in 3–6 months, while B12 stores last >3 years.
  - Folate: Found in green leafy vegetables, While B12: Found only in animal-derived foods.
  - Treat B12 deficiency before folate to prevent worsening of neurological complications (SACD).

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

VITAMIN B12 SCENARIO

- A 40-year-old male presented with skin pigmentation and disturbance in maintaining balance. On examination, blood picture shows Hemoglobin 8g/100ml, Mean cell volume 126fl, Mean corpuscular hemoglobin 28pg, Serum iron 60mmol/L, Serum ferritin is 600ng/ml. The most likely diagnosis is = megaloblastic anemia
  - It is also asked as
    - A 40-year-old male presents with anemia and numbness of extremities. His blood examination shows mild unconjugated hyperbilirubinemia, Hb - 8.6gm% and MCV 106 fl. He is most likely suffering from: = Vitamin B12 deficiency
- A female presented with fatigue, pallor, and tingling sensation and glossitis. This is due to the deficiency of? = Vitamin B12

  - It is also asked as
    - A 35-year-old woman presented with a history of weakness, palpitations, and breathlessness on exertion, tingling of feet, and difficulty in walking. Her blood examination showed Hb 5g/dl, TLC 3,500/cm, Platelet count 120,000/cmm. The most likely diagnosis is: = Vitamin B12 deficiency
    - Pt came with pallor and numbness in extremities. O/E mild unconjugated hyperbilirubinemia. Hb=7.5, MCV high, platelets normal. Diagnosis = Vit B12 deficiency
    - Patient with pancytopenia and tingling sensation in feet, diagnosis = Vitamin B12 deficiency
    - Diagnosis for 35-year-old woman with weakness, palpitations, and tingling with Hb 5, TLC 3,500, Platelets 120,000 = Vitamin B12 deficiency
- A scenario of B12 anemia = Pt has loss of sense of vibration
- Megaloblastic anemia associated with degeneration of the spinal cord is observed in severe deficiency of? = Cobalamin (Vitamin B12)
- Patient presents with lethargy, fatigue, pallor, MCV 132, diet of rice and fish. Cause? = Vitamin B12 deficiency
- Macro oval oocyte, hypersegmented neutrophils, and thrombocytopenia indicate = Vit B12 deficiency

VITAMIN B12 DEFICIENCY: INVESTIGATIONS AND CAUSES

- A biochemical indication of vitamin B12 deficiency can be obtained by measuring the urinary excretion of: = Methyl malonic acid
- Investigation of choice for a child with megaloblastic anemia = Serum B12 assay
- A 2-year-old child presented in outpatient department with fever pallor and bowel disturbance. The investigation which will confirm the diagnosis is = Serum vitamin B12
  - It is also asked as
    - A child of 2 years presents in OPD with fever, pallor, and bowel disturbance. Lab investigation revealed Hb 5.6%, MCV 107, MCHC increased. Investigation of choice is = Serum Vit B12 levels
    - A child presents to you with fever and abdominal pain. O/E raised MCV and low Hb. What diagnostic test would you carry out = Serum B12
- A 60-year-old had terminal ileum and ileocecal junction resection. In the long run, he is likely to have a deficiency of? = Vit B12
  - It also comes as:
    - A man presents with pallor with malabsorption problems. Blood exam revealed decrease RBC count, anisocytosis, and poikilocytosis with raised MCV. Which part is affected = Ileum
    - Terminal ileum resection causes = Vit B12 deficiency
- For absorption of Vitamin B12, what is necessary = Intrinsic factor
  - It also comes as
    - Intrinsic factor is required for activation of? = Vitamin B12
    - Regarding Intrinsic factor = In small intestine, bonds to cobalamin
- For absorption of vit. B12 which of the following cells produces required factor = Parietal cells
  - It is also asked as
    - A 70-year-old woman needs to take intramuscular vitamin B12 shots after undergoing gastrectomy for Zollinger-Ellison syndrome. Absence of which of the following cell types is responsible for this vitamin replacement therapy = Parietal cells
    - Inj. Vitamin B12 needed in gastrectomy due to = Loss of parietal cells
- Homocysteine level increases in which vitamin deficiency? = Vitamin B12
- Vitamin B12 carried in blood by = Transcobalamin 2
  - It also comes as:
    - Vit B12 transported by = Transcobalamin 2
    - Cobalamin is transported in blood by = Transcobalamin 2
- Pernicious anemia after gastrectomy should be treated with? = Inj Vit B12
- Treatment for macrocytic anemia after gastrectomy = Injectable B12

  - It is also asked as
    - Treatment of anemia after total gastrectomy is = IV Vit B12
    - IV B12 is used in = Ileal resection
    - A person with resection of stomach. Which vitamin will be given to prevent deficiency = Vit B12
- Pt with Hb 8, WBC 3 and platelets 50. His balance disturbed and has skin pigmentation. MCV is 110fl. Diagnosis= Megaloblastic
- Regarding megaloblastic anemia= Oval macrocytosis
- A pt has tingling sensations in his peripheral body and lab investigation reveal raised MCV. What is the most probable pathology = Pernicious anemia
- Most likely cause of pernicious anemia is = Autoimmune atrophic gastritis
- Anemia, MCV raised, hypersegmented neutrophils. Diagnosis = Pernicious anemia
- Which of following differentiates pernicious anemia from other causes of Vit B12 or folate deficiency= Achlorhydria.

FOLIC ACID DEFICIENCY

- Pregnant lady is advised to eat green vegetables. Which nutrient is she advised which plays important part in development of fetus = Folic acid
- A patient in whom MCV is 120. Which one of the following deficiencies could cause this = Folic acid
- Pregnant lady using ferrous only results in = Folic acid deficiency
- 30+ weeks pregnant lady taking only iron tablets can have deficiency of = Folic acid
- A 14-year boy eats only fast food. His peripheral blood picture shows low Hb and raised MCV. What is the likely diagnosis = Folic acid deficiency
- In megaloblastic anemia = Decrease Hb, increase MCV and MCH
- Most common cause of macrocytic anemia is= Folic acid & Vit B12 deficiency
  - Sometimes it comes with both options and separate
    - Most common cause of macrocytic anemia is = Folic acid deficiency
    - Folic acid deficiency is mostly due to malnutrition, most common generally and in our population, while vitamin B12 deficiency is mostly due to malabsorption that occurs over many years.

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204. INTRINSIC FACTOR IS SECRETED FROM= GASTRIC FUNDUS

SOME PAST PAPER MCQs

- Parietal cells are located in = Fundus
- The characteristic microscopic feature of parietal cells of the stomach is = Copious eosinophilic cytoplasm and a central nucleus
- Regarding the histology of the gastrointestinal tract, one of the following statements is correct = Parietal cells of the human stomach secrete gastric intrinsic factor
- Secretion of HCl by gastric parietal cells is most likely needed for = Activation of pepsinogen to pepsin
- Parietal cells release = Intrinsic factor and HCl
  - It is also asked as
    - HCL and Intrinsic Factor is secreted by = Parietal cells
    - Which cells secrete intrinsic factor = Parietal cells
    - A patient presented to OPD with S/S of Vit B12 deficiency and no intrinsic factor. Which cells have likely been affected = Parietal cells
- Which of following differentiates pernicious anemia from other causes of Vit B12 or folate deficiency= Achlorhydria.
- A 60 years old lady was admitted in the surgical ward for gastrectomy. Absence of one of the following cell types in the stomach is responsible for this vitamin replacement requirement = Parietal cells
- For absorption of Vitamin B12, what is necessary = Intrinsic factor
- Destruction of parietal cells causes = Pernicious anemia
- Anti-intrinsic factor antibodies diagnostic for = Pernicious anemia

- Red blood cells: = Have a higher respiratory quotient than parietal cells

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205. INTRAVASCULAR HEMOLYSIS IS DIAGNOSED BY=DECREASED HAPTOGLOBIN

HAPTOGLOBIN (HP)

- Haptoglobin (Hp) binds free Hb. In intravascular hemolysis, free Hb enters circulation, Hp binds it (↓ Hp), and the complex is cleared by the reticuloendothelial system (mainly spleen).

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- A 21-year-old man has scleral icterus, a bilirubin level of 3.6, and low haptoglobin levels. The most likely cause? = Intravascular hemolysis
- Increased intravascular hemolysis is diagnosed by= Absence of haptoglobin in plasma
- Hemoglobin binds to= Haptoglobin
    - It also comes as
        - A young man developed hemolytic transfusion reaction after transfusion of incompatible blood. Free hemoglobin liberated due to hemolysis would start excreting in the urine after a plasma protein becomes saturated with free hemoglobin. This plasma protein is=Haptoglobin
        - Which of the following protein binds free hemoglobin in plasma= Haptoglobin
        - The plasma protein which can bind free hemoglobin is? = Haptoglobin
- After hemolysis, Haptoglobin= Binds with free Fe
- A patient is having autoimmune disease involving kidneys and the lungs. His reticulocyte count is 9 and Hb is 7gm/dl. What will be present= Decreased haptoglobin
- Decreased haptoglobin is seen in? = G6PD deficiency

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206. HEMOLYTIC ANEMIA ASSOCIATED WITH= UNCONJUGATED HYPERBILIRUBINEMIA

NOTE THE CAUSES OF NORMOCYTIC ANEMIA

Intrinsic Hemolytic anemia (anemia with intrinsic cause, RC ↑)

Hereditary spherocytosis (membrane defect)	❖ Spherocytes→ small, round RBCs with less surface area and no central pallor ❖ Increased MCHC and Negative coomb's test
G6PD	❖ Most common form of enzyme deficiency hemolytic anemia ❖ Self-limiting disease, Affects only males. ❖ Heinz bodies Drugs causing G6PD. ❖ Mnemonic: Haemolysis **IS D PAIN** ○ Isoniazid, Sulfonamides, Dapsone, Primaquine, Aspirin, Ibuprofen, Nitrofurantoin
	Extrinsic Hemolytic anemia (RC ↑)
Autoimmune	❖ Warm antibody autoimmune hemolytic anemia→ IgG ❖ Cold agglutinin disease:→ IgM ❖ Coombs test positive
Microangiopathic	○ Schistocyte ("helmet cell")
Macroangiopathic	○ Schistocyte ("helmet cell")
Infections	

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

HEREDITARY SPHEROCYTOSIS

- Anemia in spherocytosis is produced because of = RBC's fragility

- The most common protein that may be defective in hereditary spherocytosis is = Spectrin
    - It also comes as:
        - Integral part of RBC membrane is = Spectrin
        - The biconcave shape of RBC is maintained by which protein = Spectrin
- A pt presents with splenomegaly and anemia. The peripheral film shows spherocytosis. Cause is = RBC cytoskeletal anomaly
- Anemia in hereditary spherocytosis occurs due to = RBC shape
- A 20-year female presented with symptoms of anemia. Clinical examination revealed pallor, mild jaundice, and splenic enlargement. Her investigations showed Hb 6.5g/dl, Reticulocyte count 9%, and Spherocytes in blood smear. Which of the following investigations is most likely to help in diagnosis = RBC survival study
- Scenario of hemolytic anemia, splenomegaly, Retic count 11, spherocytes seen. Next step = Membrane stability test

G6PD DEFICIENCY

- Following are X-linked diseases = G6PD
- A pt took primaquine for malaria and developed anemia. Peripheral film showed Heinz bodies and bite cells. Diagnosis = G6PD deficiency
- A child presented to OPD with 104 fever for the last 4 days. He has been passing cola-colored urine for the last one day, his LFTs are deranged with increased unconjugated bilirubin and gives history of using antimalarial. Diagnosis is = G6PD
    - Know the difference:
        - A female presented to OPD with 104 fever for the last 4 days and gives history of using Co-trimoxazole. She has been passing cola-colored urine for the last one day with deranged LFTs and increased unconjugated bilirubin. What is the likely diagnosis = Black waterfever
            - For G6PD females are carriers so rarely affected & so here Dx is Black water fever & cause is P. falciparum.
            - If no gender discrimination i.e., child, then:
            - Fever + cola-colored urine → Dx is Black water fever caused by P. falciparum.
            - Fever + antimalarial drugs + developed cola-colored urine → Dx is G6PD.
- The most common presentation type of G6PD is = Acute Intravascular hemolysis
    - Note:
        - Few were with the option of Favism.
        - Favism is not the common presentation; it's only common in Mediterranean types which are rare.

HEMOLYTIC ANEMIA

- The most common manifestation of autoimmune disease is: = Haematological changes
- Most autoimmune hemolytic anemias are mediated by autoantibodies that are = Warm IgG
- The most common cause of autoimmune hemolytic anemia is? = Idiopathic
- A 32-year-old female presented with jaundice. She gave a history of fleeting joint pain and low-grade fever. Blood tests showed Hb 6.5 g, WBC 2,800, platelets 45,000, reticulocytes 12 %, Direct Coomb's test is positive. The most likely cause of her jaundice is: = Autoimmune hemolytic anemia
    - It is also asked as
        - A young female with low-grade fever, jaundice, joint pain, and Coomb's test positive likely has = Autoimmune hemolytic anemia
        - A young female with history of low-grade fever, jaundice, and joint pain. Labs showed cell lines decreased, Coomb's test positive. What is the probable diagnosis = Autoimmune hemolytic anemia
- Autoimmune hemolytic anemia after transfusion is characterized by? = Coombs test positive
- A 65-year-old presents with jaundice. On work up, Hb 4.5, increased bilirubin, increased retic count 10%. Smear shows Polychromasia and clumps. What test to confirm diagnosis? = Coombs test

  - It is also asked as:
    - A 65 yr. presents with jaundice. On work up Hb 4.5, increased bilirubin, increased Retic count 10%. Smear shows Polychromasia and clumps. What test to confirm diagnosis? = Coombs test
    - A 65-year-old male presented with jaundice On work up Hb 4.5 increased bilirubin increased retic count 9% Smear shows Polychromasia and clumps What test should be done to confirm diagnosis = Coombs test
    - A 65 yr presents with jaundice. On work up Hb 4.5, increase bilirubin, increase retic count 9%. Smear shows Polychromasia and clumps. What test to confirm diagnosis? = Coombs test
    - 60 years irritable patient with Hb 4.8mg/dl. WBC and platelet normal. Retic count and bilirubin increase. Which test leads to diagnosis = Coombs test
- A woman with jaundice for 1 year. Total Bilirubin is 6. Conjugated bilirubin is 1. Cause is = Hemolytic anemia
- High Retic count, high TLC, high bilirubin, low Hb. Diagnosis = Hemolytic anemia
  - It is also asked as:
    - Patient with bilirubin 6 with direct bilirubin 0.9, with retic count 10%. Most likely cause will be = Hemolytic anemia
- Hemolytic anemia occurs after a mismatched blood transfusion. It can be diagnosed clinically = Hemoglobinuria
- A patient underwent surgery for mitral valve replacement. After 8-12 months of the surgery, she develops complaints of pallor & dark-colored urine. What is the likely cause = Macroangiopathic hemolytic anemia
- Cause of fragmented RBC in peripheral blood = Microangiopathic hemolytic anemia
- A pregnant lady who is a known case of fetal hemorrhagic disease now presents to you at 26 weeks of pregnancy. What next investigation should be done = Serial maternal antibodies

KNOW THE DIFFERENCE.

- Dapsone given to a lady for erythema nodosum by dermatologist. Now she has ↓Hb, MCV=110fl. Diagnosis= Drug induced RBC destruction
- Dapsone given for erythema nodosum by dermatologist. Now he has ↓Hb. Peripheral smear showed abnormal, small, irregular cells. Diagnosis= G6PD deficiency
  - Well, both of these scenarios were uploaded by students in their paper, I have included both, just to let you know the difference, as it might come one way or other
    - Scenario No. 1= G6PD is only manifested by males, so in lady Inc. MCV is pointing towards drug induced RBC destruction (other options were G6PD, and megaloblastic anemia, dapsone is not a cause for megaloblastic anemia either—so RBC destruction makes sense)
    - Scenario no 2 = Dapsone is a cause of hemolysis in G6PD, so then it would be G6PD, if it is a male

07. SICKLE CELLS DISEASE PROTEIN AFFECTED= BETA GLOBULIN GENE

REMEMBER

- Mutation: Point mutation at position 6 of β-globin (valine replaces glutamic acid).
- Types: HbAS (sickle cell trait), HbSS (sickle cell anemia).
- Features: Chronic leg ulcers, auto-splenectomy (Howell-Jolly bodies), septicemia/meningitis (Strep pneumoniae), osteomyelitis (Salmonella).
- Crises:
  - Thrombotic (Vaso-occlusive): Triggered by infection, dehydration, or hypoxia (e.g., avascular necrosis, hand-foot syndrome).
  - Sequestration: Blood pooling in organs (e.g., acute chest syndrome).
  - Aplastic: Parvovirus infection, sudden Hb drop.
  - Hemolytic: Rare, fall in Hemoglobin due an increased rate of haemolysis
- Additional: Causes nephrogenic diabetes insipidus.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

CAUSE AND GENETIC BASIS

- What is the component in sickle cell anemia = HbSS factor
- Sickle cell anemia has which type of mutation = Point mutation
    - It is also asked as
        - Sickle cell disease is an example of which mutation = Missense mutation
        - Sickle cell anaemia is an example of = Point mutation
- The protein likely to be responsible in case of sickle cell anemia is = Beta-globulin
- Hemoglobin type in Sickle cell anemia = HbS

CLINICAL FEATURES AND DIAGNOSIS

- Abnormal shaped RBC associated with occlusion of vessel occurs in which of the following = Sickle cell Anemia
- Diagnosis in a patient with capillary occlusion, low Hb, and dystrophic morphology = Sickle cell anemia
- Chronic leg ulcers with Howell-Jolly bodies are caused by = Sickle cell disease
- Sickle cells in blood seen in a patient with repeated blood transfusions and a non-healing ulcer = Sickle cells

CRISES AND COMPLICATIONS

- A patient having fever, some treatment was given, now presented with jaundice and painful leg ulcers. What is the patient now suffering from = Vaso-occlusive crisis
- Scenario of sickle cell anemia with Hb 6 and mild jaundice = Hemolytic crisis
- A boy having Hb 5.6, deeply jaundiced, PLT 260,000 and TLC 10,000, Retic count 10%, conjugated bilirubin 0.9, hypersplenism, having non-healing ulcers, abdominal pain after tooth extraction. Diagnosis = Hemolytic crisis
- Pt with known case of sickle cell anemia presented with high grade fever and deep jaundice. Labs showed low Hb and normal platelets. What type of crisis has occurred = Hemolytic
- A 6-year-old African boy with sickle cell disease and jaundice likely has = Hemolytic crisis
- The organism most likely responsible for osteomyelitis in a sickle cell anemia patient = Salmonella

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208. INCREASED BT IS OBSERVED IN = VWF DEFICIENCY

FOR THESE DISORDERS REMEMBER THIS CHART

Disorder	PT	aPTT	Platelet count	Bleeding time	Notes
Heparin	↑	↑↑	Normal	Normal	
Liver Disease	↑	↑	↓/Normal	↑/Normal	↑AST
Vit K def	↑↑	↑	Normal	Normal	
Haemophillia	Normal	↑↑	Normal	Normal	Hemophilia A: deficiency of factor VIII --↑ PTT; X-linked recessive. Hemophilia B: deficiency of factor IX --↑PTT; X-linked recessive. Hemophilia C: deficiency of factor XI --↑PTT; autosomal recessive.
vWD	Normal	↑↑	Normal	↑	
HUS	Normal	Normal	↓	↑	❖ TRIAD o Thrombocytopenia o MAHA

					○ Renal failure (more marked in HUS)
TTP	Normal	Normal	↓	↑	Clinical features- PENTAD ○ Thrombocytopenia ○ MAHA ○ Neurological symptoms: headache, confusion, focal defects, seizures ○ Renal failure ○ Fever
ITP	Normal	Normal	↓	↑	
DIC	↑	↑	↓	↑	↑ D-dimers. Fibrin degradation products

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

SCENARIOS RELATED TO HEMOPHILIA

- A boy with bleeding gums, a family history of similar bleeding, and deranged APTT is likely deficient in = Factor VIII.
    - It also comes as
        - A patient with purpura. Labs show APTT prolonged. PT & BT normal, cause? = Factor 8 deficiency
        - A 6-year-old male child presented with a painful, swollen, tender knee joint. Screening tests showed: Bleeding time - 4 sec, prothrombin time 16 sec (control 14 sec) and APTT 110 sec (control 35 sec). The most helpful investigation would be: = factor VIII assay.
        - For a patient with prolonged APTT, the most helpful investigation would be = Factor VIII assay
        - The most important diagnostic investigation in hemophilia is = Decreased levels of factor VIII
        - Classic hemophilia is caused by deficiency of = Factor 8 major
        - Factor 8 deficiency causes= Hemophilia
        - Cause of Hemophilia = Decrease factor VIII (Note the word decrease)
        - A boy with swollen left knee and hx of excessive bleeding after circumcision- What test should be done to confirm diagnosis = Factor 8 assay
        - A patient with purpura. Labs show APTT prolong. PT & BT normal, cause = Factor 8 deficiency
- In patient with Hemophilia, Deficiency of which unit of factor 8 = Factor 8 light chain
    - It is also asked as
        - Classic hemophilia is due to = Factor 8 small component
        - A boy had extraction of deciduous teeth and now is profusely bleeding. Which classic hemophilia factor is missing = Deficiency of Factor 8 minor component
        - Most common cause of deranged APTT and normal PT = Factor 8 inhibitor
        - Diagnostic test for Hemophilia = Factor 8 assay
        - Classic hemophilia is caused by = Factor 8 minor
- A young boy presents in outdoor with history of sudden painful swelling of joints after minor trauma, hematuria, and petechiae. The most likely diagnosis is = Hemophilia
    - It is also asked as
        - Diagnosis for a boy with sudden painful joint swelling and a maternal family history of similar conditions? = Hemophilia
        - A young boy presented with purpura, RBCs, WBCs, PLT normal. PT, BT normal, CT prolonged. He is suffering from = Hemophilia A
- A 2-year-old boy has been brought to the hospital for circumcision. There is history of excessive bleeding from the umbilical stump at the time of birth. Two cousins bleed profusely after circumcision by surgeon. The blood test most likely to give a clue to the diagnosis is = APTT

  - It is also asked as
    - Siblings have also bleeding problem bleeding from umbilical stump best test= APTT
    - Which is specific for Christmas disease = Prolong APTT
- Hemophilia A is best treated with? = Cryoprecipitate
  - It is also asked as
    - Which of the following is the best treatment for hemophilia A? = Cryoprecipitate
    - A patient with hemophilia-A treatment = Cryoprecipitate
- Cryoprecipitate contains which of the following factor= Factor 8
  - It is also asked as
    - When factor 8 is not available, the next best source is=Cryoprecipitate
- A 7-years-old boy suffering from Christmas disease requires surgery for hemarthrosis In case of non-availability of factor IX, the next best source of factor IX is = Fresh frozen plasma
  - It is also asked as
    - In the absence of factor IX, the next best source of factor IX is = Fresh frozen plasma
- Hemophilia A is inherited as = X-linked recessive
  - It is also asked as
    - The genetic inheritance of Hemophilia is? = X linked recessive
    - A mother can pass which disease only to her son if she is a carrier = Hemophilia
- Which of the following deficiency is present in hemophilia A = Anti-hemophilia globulin
- Which of the following is present in acute episode of joint pain in a hemophilic child = Cholesterol crystals
- Bleeding time is NOT increased in = Hemophilia A
  - It also comes as
    - Bleeding time remains normal in = Hemophilia (factor 9 deficiency)
    - Bleeding time is normal in = Factor 9 deficiency
- The most characteristic bleeding pattern in hemophilia is = Tissue bleeding
- A pt with PT normal 14, increase BT 6 min, increase APTT 60, normal platelet count and gives bleeding history. Diagnosis = Intrinsic pathway
- A 6-year-old boy presented with painful, tender, swollen knee joints for the past 6 months. He gives Hx of profuse bleeding during circumcision with no family history positive. Most appropriate investigation to reach the diagnosis would be = Factor 8 assay
- A 2-year old fell off the bed and develops a hematoma on forehead. Routine labs show no abnormality but the mother gives history of her brother profusely bleeding from circumcision. Next investigation done should be = Coagulation profile

SCENARIOS RELATED TO DIC

- A lady had a difficult labor at home in a village. She was brought to the hospital with a history of p/v bleeding & oozing from gums for the last 10 hours. Her CBC shows Hb: 6 g/dl, platelets 30,000/cumm, TLC 24,000/cumm with neutrophilia. The peripheral blood film shows burr cells. Her PT & APTT were prolonged. The most likely cause is= Disseminated intravascular coagulation (DIC)
  - It is also asked as
    - The most likely diagnosis for a patient with excessive bleeding after delivery and prolonged PT/APTT is= Disseminated intravascular coagulation
    - The most likely cause of a patient's illness with purpuric rash, prolonged PT, and APTT is= Disseminated intravascular coagulation
    - A female presented with excessive bleeding after delivery. Results of investigations were as follows: Platelet count = 70,000/ul, APTT 35 sec (control = 32 sec), PT = 30 sec (control = 16 sec). The most likely diagnosis is= Disseminated intravascular coagulation
    - A female with excessive postpartum bleeding and abnormal clotting profile likely has= Disseminated intravascular coagulation (DIC)

    - Pregnant female has single vaginal delivery at home in village. After delivery she complains of vaginal and gum bleed. Her platelets and Hb were low and TLC raised, PT and APTT prolonged. Diagnosis= DIC
    - A child with fever, leukocytosis, petechiae after splenectomy. His Labs showed PT and APTT prolonged, thrombocytopenia, and increased FDP. Diagnosis= DIC

- The most likely thrombogenic agent which initiates the process of disseminated intravascular coagulation (DIC) is= Tissue thromboplastin
  - It is also asked as
    - The major initiating mechanism of DIC in patients with massive trauma, extensive surgery, or severe burn is= Release of thromboplastin
    - Which of the following is involved in eliciting DIC= Tissue Thromboplastin
- The most characteristic finding in disseminated intravascular coagulation (DIC) is= Positive D-dimer test
- Which of the following end effects of sepsis has very poor prognosis= Disseminated intravascular coagulation
  - It is also asked as
    - Poor prognostic factor in septic shock patient is= DIC
- Regarding bleeding disorders, the most likely finding is= Disseminated intravascular coagulation is usually associated with a decreased platelet count
- One of the following statements about disseminated intravascular coagulation (DIC) is NOT appropriate= Fibrin degradation product levels are low
- The most SPECIFIC test for DIC is= D-dimer
- The most common coagulopathy in trauma is= DIC
- Scenario with Gram –ve Sepsis and bleeding diathesis. Diagnosis= DIC
  - It also comes as
    - Septic shock scenario where the patient has bruises and D-dimer was raised. Possible cause= DIC
    - In burn patient, fever, hypotension, and bleeding diathesis. What is the diagnosis= DIC
- A patient diagnosed as DIC, which of the following is most useful for diagnosing DIC= Presence of fibrin degradation products (FDP)
- A child has undergone splenectomy, now presents with epistaxis and multiple petechiae over the body. Which of the following is most likely= ↑ PT, ↑ APTT, ↑ BT, ↑ D-DIMERS
- Characteristics of DIC= PT, APTT raised + low platelets

SCENARIOS RELATED TO ITP

- A 19-year-old girl with a petechial rash is otherwise completely well. She has no history of bleeding or major illness. The examination of the peripheral smear is normal except for a low number of platelets. The most likely diagnosis in this patient is= Idiopathic thrombocytopenic purpura (ITP)
  - It is also asked as
    - A 19-year-old girl with a petechial rash and low platelets likely has= Idiopathic thrombocytopenic purpura (ITP)
    - A Patient having gum bleed and normal RBC and WBC count. Peripheral smear shows Large Platelets & count 45000, diagnosis= ITP
    - A child presented with the complaint of on and off bruises with episodes of epistaxis. His bleeding time is prolonged with normal PT and APTT. What is the most likely diagnosis= ITP
    - The most likely diagnosis in a patient with menorrhagia, epistaxis, and platelet count of 12x10^9/L = ITP
    - Likely diagnosis in a child with petechiae, Hb 11, PLT 20×109, WBC 6000 =Acute ITP
- An otherwise healthy 18-year-old girl has menorrhagia and epistaxis for the last 25 days. General physical examination revealed pallor, petechial spots, and bruises. The platelet count is 12x109/L. Bone marrow examination shows megakaryocytic hyperplasia. The most likely diagnosis in this patient is= ITP
  - It is also asked as

    - Idiopathic thrombocytopenic purpura (ITP) is mostly characterized by= Increased megakaryocytes in marrow
    - An 18 yr. old girl presented with epistaxis and menorrhagia. On bone marrow aspirate, there is hyperplasia of megakaryocytes, the most likely diagnosis is= ITP
    - Menorrhagia, epistaxis. Bone marrow shows increased megakaryocytes. Diagnosis = ITP

- A pregnant woman with ITP, ecchymosis, and epistaxis on high-dose steroids should receive= IV Immunoglobulin
- Child PT and APTT normal but prolonged BT =Idiopathic thrombocytopenic purpura
  - It is also asked as
    - Normal PT, normal aPTT, only thrombocytopenia = ITP
    - A child has on/off bruises and epistaxis, increased BT, normal PT and aPTT = ITP
    - The abnormally prolonged laboratory finding in idiopathic thrombocytopenic purpura is= Bleeding time
- 7-month pregnant female with chronic ITP, now having ecchymosis and epistaxis. Her platelet count was 10000 and is on full dose steroid. What is the next best treatment= Splenectomy
- 60 yr. female with petechiae, easy bruising, no family history and causative factor. Diagnosis= ITP
- A 5-year-old boy comes with overnight petechial spots. 2 weeks back, he had a history of abdominal pain and no hepatosplenomegaly. Diagnosis is= Idiopathic thrombocytopenic purpura
- A female patient presents with submucosal bleed and low platelet count. She was diagnosed as a case of immune thrombocytopenic purpura and was started on IVIGs and transfused platelets. What is the mechanism of action of IVIG= Fc portion of receptors blockage
- Patient with ITP is given IVIG. What is the mechanism of action of IVIG= Competitively binds to receptors on macrophages

KNOW THE DIFFERENCE

- A 9-month girl vaccinated 2 weeks back now develops rash all over body and fever. CBC reveals Hb 13, WBC 6×10 and decrease platelet. Peripheral smear shows large platelets. What is the likely diagnosis= ITP (childhood ITP)
- A young girl presented with history of gum bleeding. Peripheral smear showed giant platelets and the total platelets count is 85K, WBC count is 5*10. The likely diagnosis is=Bernard Soulier
- A Patient having gum bleed and normal RBC and WBC count. Peripheral smear shows Large Platelets & count 45000, diagnosis= ITP (There is marked decreased platelets in ITP (10 to 50K) while in Bernard Soulier there is moderate thrombocytopenia while sometimes normal)

[illegible]

- The most common inherited bleeding disorder is = Von Willebrand disease
- A child on the list for an orthopedic surgical procedure. The mother gives a strong bleeding family history in both males and females from the maternal side. Labs show PT normal, APTT raised, BT raised. The diagnosis is = Von Willebrand disease
  - It also comes as
    - A 5-year-old child presents with repeated episodes of epistaxis and gum bleeding. Blood shows Hb 10, platelets normal. BT more than 20 minutes, APTT 28s. The diagnosis is = Von Willebrand disease
    - A 16-year-old female presented with epistaxis and menorrhagia. Her screening tests revealed: Bleeding time = 14 minutes, platelet count = 280,000/uL, PT 15 sec (control 14 seconds), APTT 55 seconds (control 32 seconds). The most likely diagnosis is = Von Willebrand's disease
    - Increased bleeding time, normal PT, and increased APTT suggest = Von Willebrand's disease
    - An 18-year-old male patient with increased bleeding from the gums after tooth extraction three days back. He does give previous history of increased bleeding from minor cuts. Investigations reveal increased bleeding time and increased APTT. His most likely diagnosis is = Von Willebrand's disease

    - A 5-year-old child is scheduled for an orthopedic surgical procedure. The patient's mother describes a strong family history of bleeding in both male and female relatives on the maternal side. Routine preoperative laboratory studies include the following: Prothrombin time 11.2 sec (normal 11.0 to 12.0 sec), partial thromboplastic time 62.3 sec (normal 22.0 to 28.0 sec), bleeding time >20 min (normal 7 to 9 min), platelet count 280,000/mm3 (normal 150,000 to 400,000/mm3). The most likely diagnosis is = Von Willebrand's disease

- In von Willebrand disease, the best treatment option is = Cryoprecipitate
  - It is also asked as
    - The most appropriate component for the management of Von Willebrand disease is = Cryoprecipitate
- A 5-year-old boy with epistaxis and prolonged bleeding time most likely has = Von Willebrand's disease
  - It is also asked as
    - The most characteristic feature of Von Willebrand disease is = Prolonged bleeding time
- Von Willebrand's factor produced by platelets and vascular endothelial cells is responsible for = Platelet adhesion
  - It is also asked as
    - Von Willebrand factor is responsible for = Platelet adhesion
    - Von Willebrand factor is released from the = Endothelium
- Blood disorder causing purpura is = Von Willebrand disease
- Diagnosis in a child with normal PT, raised APTT, and BT, strong family bleeding history is = Von Willebrand disease
  - It is also asked as
    - A young girl having a bleeding problem with her brother suffering from the same problem. Laboratory investigations revealed increased BT, normal PT, raised APTT, and normal platelets. The most likely deficiency is = von Willebrand factor
    - A young boy presents with bleeding. Labs show BT increased, APTT increased, and platelets normal. The diagnosis is = Von Willebrand disease
    - A patient with ↑BT, ↑ APTT & normal PT with platelet count of 180,000 is most likely to have = Von Willebrand disease

SCENARIOS RELATED TO OTHER DISORDERS

- A patient with liver cirrhosis needs transfusion before surgery= FFP
- Newborn with normal bleeding time, prolonged PT and prolonged APTT. Most likely cause is= Vit K deficiency
- PT prolonged in= Liver disease
- PT monitoring is useful in= Liver disease
- A child just born has blood stools with increased PT and APTT but normal BT= Vit K
- Fragmented RBC's along with fever and altered mental status= TTP

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209. WHICH CLOTTING FACTOR DEFICIENCY CAUSES COAGULATION RATHER THAN BLEEDING= FACTOR 12

NOTE ABOUT THE THROMBOTIC DISORDERS

Diseases	Description
Factor V Leiden	❖ This is the most frequent cause of hereditary thrombophilia (prothrombotic familial syndrome occurring most often in adolescents or young women) ❖ This is due to an abnormal factor V ❖ Also known as **"hereditary resistance to activated protein C"**.
Anti-phospholipid antibody syndrome	❖ This prothrombotic disorder is characterized by autoantibodies directed against phospholipids. ❖ 1° or 2° autoimmune disorder (**most commonly in SLE**). ❖ Diagnose based on clinical criteria including history of thrombosis (arterial or venous) or **spontaneous abortion** along with laboratory findings

	❖ Lab findings: **lupus anticoagulant** (↑aPTT), anticardiolipin antibody, anti-β2 glycoprotein antibodies.
Protein C or S deficiency	❖ ↓ Ability to inactivate factors Va and VIIIa. ❖ ↑ Risk of thrombotic skin necrosis with haemorrhage after administration of warfarin. If this occurs, think protein C deficiency. ○ Together, protein C Cancels, and protein S Stops, coagulation.

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Which clotting factor deficiency causes coagulation rather than bleeding= Factor 12
- A Young pregnant lady with history of recurrent abortions and thrombosis, which condition is she most likely suffering from= Anti-phospholipid syndrome
- Most common **acquired** thrombotic disorder= Anti-phospholipid Syndrome
  - While most common **#inherited** thrombotic disorder is =factor V Leiden
- Patient on warfarin for 2 days develops ecchymosis. Cause= Protein C deficiency
- Most common cause of acquired thrombosis is=Anti-phospholipid antibody syndrome
- A 25 yr pregnant lady presented with recurrent abortions and thrombosis. Diagnosis=Antiphospholipid syndrome
- Most common pro-thrombotic point mutation is=Factor 5
- Anticardiolipin antibody is present in=Mitochondrial membrane

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210. INTENSE TRANSFUSION REACTION OCCURS IF WE TRANSFUSE = A+ TO O -IVE

Remember

- General rules:
  - O-negative → universal donor (but can receive only from O –ive)
    - Also remember that O +ive can only receive from O blood group
  - AB-positive → universal recipients
  - +ive can only give to +ive
  - –ive can give it to both +ive and –ive
- Note that
  - Anti H antibodies are seen in= Blood group OH

Blood group	Can donate to	Can receive from
A +ive	A +ive, AB +ive	A +ive, A-ive O +ive, O -ive
B +ive	B +ive, AB +ive	B +ive, B-ive O +ive, O -ive
AB +ive	AB +ive	**UNIVERSAL RECIPIENT** can receive from anyone whether positive or negative
O –ive	**UNIVERSAL DONOR**	but receive only from O –ive
O +ive	All except O –ive (bcz + cannot give to -)	O +ive, O-ive
A –ive	A +ive, A –ive, AB +ive, AB -ive	A-ive, O –ive
B –ive	B +ive, B –ive, AB +ive, AB -ive	B-ive, O –ive
AB –ive	AB +ive, AB –ive	A-ive, B –ive, O –ive, AB -ive

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

BLOOD GROUP CHARACTERISTICS

- Regarding a mother with O-ve blood group = Both anti-A, anti-B antibodies in her blood
- Anti H antibodies are seen in = Blood group OH
- The blood group O will have which of the following antigen on RBC surface = Neither A nor B

- Regarding A +ive blood group = Anti B antibodies present in plasma
- Blood group with No agglutinins = AB positive
  - It is also asked as
    - Blood agglutinin is absent in which of the following blood group = AB+
- A blood group type with no agglutinins, Agglutinogens and Rh factor is = O negative
- Blood Agglutinogens = Glycoprotein in nature

BLOOD GROUP TRANSFUSION COMPATIBILITY & DISEASES

- A blood group can receive transfusion from = A+ and O -ve
- A 28-year pregnant lady, who is Rh negative, gives birth to an Rh-negative baby. She was transfused Rh-positive blood accidentally. Which of the following is true? = Anti-D antibody should be given immediately to the lady
- A blood transfusion of AB+ to O- results in = Hemoglobinuria
- A patient with O- blood group was transfused 4 pints of O+ blood. What will happen next? = Acute hemolytic transfusion reaction
- Blood transfusion reaction is likely to occur when a person having blood group A+ is transfused with blood of group? = AB-
- A baby born with Erythroblastosis fetalis, her blood group is B+, exchange transfusion with which of the following group should be done? = B-
- Gravida 2 first pregnancy normal, 2nd boy delivered at 32 weeks with hydrops fetalis, icteric phase, exchange transfusion done. What is the type of immunity? = Complement Mediated Hypersensitivity
- The factor NOT responsible for coagulopathy following multiple blood transfusions is = Thrombocytosis
- A disease NOT transmitted by blood transfusion = Tuberculosis
- The incompatible blood group most likely causing transfusion reaction in a patient with A+ blood is = B-

BLOOD GROUP CHARACTERISTICS

- Regarding blood group antigens = Equally immunogenic (if glycoproteins in option prefer that)
- People with blood group A+ are likely to develop which of these = Ca stomach
- A mother with blood group "O" has a baby with "AB". Parents fear their baby got exchanged in nursery with other babies. What test can be done to confirm that the baby is theirs? = Pheno-Bombay typing
  - ✓ (taken from Ref "Lange Q&A Obstetrics & Gynecology", 9th Edition - Page 42 question no 18)
- In Caucasians, the percentage of blood group O in a population is = 47% (O-positive = 37 while O-negative = 8 total 45)

TRANSFUSION REACTIONS & MANAGEMENT

- Pt presented with severe trauma and he has lost huge blood, there is no blood group matched available. which of following can be given in emergency situation = Blood O-ive
- Washed red cells are used to avoid the problem of = Febrile transfusion reaction
- Ten minutes after beginning a blood transfusion, the patient complained of severe chest pain and anxiety. He is found to be hypotensive, tachycardic, and has dark red urine strongly positive for hemoglobin and negative for myoglobin. The most likely cause is = A major hemolytic transfusion reaction due to clerical error
- Severe blood group transfusion reaction is most likely to occur after a donation of blood from = A+ to O+ person
- A young woman in labor room requires blood transfusion. Her blood samples were sent to laboratory for blood group and cross match. The laboratory reports that her red cells are agglutinated by antisera A and D while her serum is agglutinating B cells. The most suitable blood donor for her would be=A positive
  - ✓ Blood cells agglutinate with same blood group anti-sera → like If cells agglutinate with anti-sera A then blood group is also A and If cells agglutinate with anti-D then its positive agglutination and it's also positive blood group .so (A +ive) blood group
  - ✓ Anti-sera agglutinates with B and D and plasma has anti A antibodies. The blood group is= B +ive

UNIVERSAL DONOR/RECIPIENT

- For blood transfusion, the blood group considered the best universal donor is = O negative
- For blood transfusion, the blood group considered as "Universal Recipient" is = AB-positive
- Pt presented with severe trauma and he has lost huge blood there is no blood group matched available which of following can be given emergency situation=Blood O-ive

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211. THALASSEMIA PATIENTS REQUIRE FREQUENT, MULTIPLE TRANSFUSION OVER A PERIOD OF TIME. THEY ARE AT RISK OF DEVELOPING= HEMOSIDEROSIS

REMEMBER:

- Massive transfusions: Hypocalcemia
- Repeated transfusion or multiple transfusion over a period of time: Hemochromatosis / Hemosiderosis
- Multiple transfusions: Hyperkalemia

NOW LET'S DISCUSS SOME PAPER MCQ'S

- A patient has undergone multiple transfusions now have tall T waves on ECG= Hyperkalemia
- Repeated transfusion risk of=Hemochromatosis
- Thalassemia patient require frequent, multiple transfusion over a period of time. They are at risk of developing= Hemosiderosis
- A thalassemia pt after having multiple transfusions later developed pain in right hypochondrium, ferritin 600. Cause is= Haemochromatosis
- A 22-year-old woman has a congenital anemia that has required multiple transfusions of RBCs for many years. On physical examination, she now has no significant findings; however, liver function tests show reduced serum albumin. Which of the following findings would most likely appear in a liver biopsy specimen=Hemosiderin in hepatocytes

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212. AN OLD MAN PRESENTS WITH PALLOR AND JAUNDICE FOR WHICH BLOOD TRANSFUSION WAS STARTED. AFTER WHICH HE STARTED COMPLAINING OF DARK COLOR URINE. CAUSE IS=HEMOLYTIC REACTION

REMEMBER THESE TRANSFUSION REACTION MCQS

- Newborn baby Anemic for which he received exchanged transfusion. After 10 days he developed diarrhea and a rash on arm spreading to body. Diagnosis= Graft versus host reaction= (this is called Transfusion-associated graft-versus-host disease)
- A baby went through exchange transfusion due to ABO disease of newborn. 10 days later, he developed erythema on palms, raised bilirubin and AST and also diarrhea. What is the likely cause= Graft vs host disease
- Blood is warmed up to 37 degrees before transfusion= Left to right shift

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213. A NEWBORN WITH BLOOD GROUP B +IVE IS HAVING ERYTHROBLASTOSIS FETALIS WHICH IS MOST APPROPRIATE LINE OF TREATMENT= EXCHANGE TRANSFUSION WITH B-IVE BLOOD

ABOUT HEMOLYTIC DISEASE OF NEWBORN

	Rh hemolytic disease of the newborn	ABO hemolytic disease
Interaction.	❖ Rh ⊖ mother; Rh ⊕ fetus	❖ Type O mother; type A or B fetus.
Mechanism	❖ First pregnancy: mother exposed to fetal blood (often during delivery) → formation of maternal anti-D IgG. ❖ Subsequent pregnancies: anti-D IgG crosses the placenta → attacks fetal RBCs → hemolysis in the fetus.	❖ Pre-existing maternal anti-A and/or anti-B IgG antibodies cross placenta → hemolysis in the fetus.

Presentation	❖ Hydrops fetalis ❖ Jaundice shortly after birth ❖ Kernicterus	❖ Mild jaundice in the neonate within 24 hours of birth. ❖ Unlike Rh HDN, can occur in firstborn babies and is usually less severe.
Treatment /Prevention	❖ Prevent by administration of anti-D IgG to Rh ⊖ pregnant women during third trimester and early postpartum period (if fetus Rh ⊕). ❖ Prevents maternal anti-D IgG production	❖ Phototherapy or ❖ Exchange transfusion
Notes	❖ The Rh factor is clinically important in pregnancy. ❖ If the mother is Rh-negative and the fetus is Rh-positive, the mother will produce Rh antibodies. ❖ This situation will not affect the first pregnancy. ❖ In the second pregnancy with a Rh-positive fetus, a hemolytic condition of red blood cells (RBCs) occurs, known as Rh-hemolytic disease of newborn (erythroblastosis fetalis). ❖ A preventive treatment known as RhoGAM, or Rh immunoglobulin, can reduce a mother's reaction to their baby's Rh-positive blood cells. This is administered as a first shot at around the 28th week of pregnancy and the 2nd shot within 72 hours after giving birth.	❖

NOW LET'S SOLVE SOME PAPER MCQ'S

- Regarding Rh Agglutinins= Predominantly IgG
- A 35 yr. pregnant Rh-negative mother gives birth to baby with signs of Erythroblastosis fetalis. Baby dies 6 hours later. At biopsy=Basal ganglia staining
- When Rh negative female marries a Rh-positive male who is homozygous, all children will be=All positive
- A Rh -ve women with rising titre of anti D antibody was delivered at 34 weeks of pregnancy. The male baby was lethargic, pale, edematous and severely anemic. He died 6 hours after blood transfusion. The post mortem report will show=Bile pigments in basal ganglia
- Mother has history of hemolytic disease of newborn. Now 26 wk. pregnancy. What to do= Mother's serial antibodies
- A new born with blood Group B +ive is having Erythroblastosis Fetalis which is most Appropriate line of treatment= Exchange transfusion with B-ive blood
- Which antibody is present in Erythroblastosis Fetalis= Ig G
- A new-born with Erythroblastosis Fetalis. Cause is= Rh incompatibility of mother and fetus
- A female within 10 minutes of transfusion develops heavy chest pain, dyspnea, becomes critical and dies on the 3rd day. Cause is=ABO incompatibility
- Anti-D antibody is clinically important because= Causes Hemolytic Disease
    - Maternal anti-D antibodies produced cross placental barrier and destroy fetal RBCs: Ref: bedside clinics in obstetrics

FEW CONFUSING MCQS

- ❖ A 28 years' pregnant lady, who is Rh negative gives birth to a Rh-negative baby. She has history of allergic reactions. Due to bleeding, she was advised transfusion but she was transfused Rh Positive blood accidently. Which of the following is true= Anti D antibody should be given immediately to the lady
  - o Although the baby is RH negative but due to transfusion there are chances mother will develop antibodies to RH positive blood
- ❖ Rh negative mother with Rh positive father .to prevent RH incompatibility in 2nd child should be given= Anti D immunoglobulin
- ❖ Mother RH negative and father RH positive conceive a baby. How will you counsel them regarding the child= Hemolytic disease of newborn may occur
- ❖ A 3-month pregnant patient who is Rh +ve and has Rh -ve husband comes to you for counselling. She is most likely to have one of the following possibilities= Antigen can enter maternal circulation from fetus

214. THE MOST COMMON CAUSE OF ANEMIA IN PREGNANCY = HEMODILUTION

NOTE THAT

- Anemia of pregnancy is not anemia but rather is a manifestation of increased plasma volume.
- With normal pregnancy blood volume increases, which results in a concomitant hemodilution. Although red blood cell (RBC) mass increases during pregnancy, plasma volume increases more, resulting in a relative anemia.

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ Most common cause of anemia in pregnancy= Plasma volume expansion
- ❖ A pregnant lady came in her first trimester her HB was 12. Now Her Hb in last trimester is 10. Diagnosis= Normal physiologic
- ❖ In pregnancy, which of the following occurs= Increase RBC mass
- ❖ A woman at 6 weeks of pregnancy have Hb 12, HCT:25 and Normocytic Normochromic peripheral film. At 32 weeks she comes for follow up with a Hb 9, HCT 20 and normocytic normochromic peripheral film. What is your diagnosis= Physiological change

215. SOLDIER COMING DOWN FROM HEIGHT HAVING PERIPHERAL CYANOSIS & BREATHLESSNESS. CAUSE IS = SECONDARY POLYCYTHEMIA

REMEMBER

Polycythemia Rubra Vera	❖ ↓ EPO (only in this type of polycythemia) ❖ Bone marrow: hypercellular marrow
Secondary Polycythemia	❖ Causes: o Hypoxia→ cardiac disease, pulmonary disease, high altitude o Carboxyhemoglobin: smoking o Kidney lesions o Erythropoietin-secreting tumors (rare) o Abnormal hemoglobin's (rare) o Diuretics use
Relative' or 'apparent' Polycythaemia (Gaisböck's syndrome)	❖ 'Stress-induced, burns or dehydration ❖ The red cell volume is normal, but as the result of a decreased plasma volume, there is a relative Polycythaemia. ❖ More common than PV and occurs in middle-aged men, particularly in smokers who are obese and hypertensive.

NOW LET'S DISCUSS SOME PAPER MCQ'S

SECONDARY POLYCYTHEMIA

- A soldier returning from Siachen glacier with splenomegaly, cyanosis, and PCV 60% likely has = secondary polycythemia
  - It is also asked as
    - A young soldier, on his way back from a height of 26,000 feet after 6 months, complains of headache and blue discoloration of his fingertips. His blood pressure is = 150/95 mmHg, PCV 60% and moderately enlarged spleen. The most likely diagnosis is = secondary polycythemia.
    - A 28-year-old soldier after retiring from Siachen glacier, having spent 6 months there, presents to CMH Rawalpindi, with complaints of headache and peripheral cyanosis of his fingers. Most probably the cause is = secondary polycythemia
    - A young soldier aged 24 years reports to the CMH, on his way back from high altitude region where he was on duty for about 6 months. He complains of headache and blueness of fingertips. On examination, he is found to have moderate splenic enlargement, BP of 150/95 mmHg and PCV 60%. He is suffering from = secondary polycythemia
- Female with Hb 19, WBC: 13000, increased PLT, erythropoietin raised and facial plethora. Diagnosis = secondary polycythemia
- Secondary polycythemia is caused by excess of = Erythropoietin

Polycythemia Vera

- The natural course of polycythemia vera most often leads to = Myelofibrosis
- Hypercellular bone marrow is seen in = Polycythemia Rubra Vera
  - Also asked as
    - In Polycythemia there is = Hypercellular bone marrow
- Cells spared (not raised) in Polycythemia Vera? = Lymphocytes
  - Also asked as
    - In a patient with Polycythemia Vera, the blood levels of which of these is expected to be normal = Lymphocyte

General Polycythemia Diagnosis

- A 40-year-old non-smoker presents with splenomegaly and a congested face. The feature which best supports the diagnosis of polycythemia is = Increased red cell mass
  - It is also asked as
    - Scenario of polycythemia with facial congestion and splenomegaly. Diagnosis = Increase RBC mass
    - At high altitude, in polycythemia what changes are present = increased red cell mass
- Scenario of an old person presented with weakness and lethargy. Blood shows increased RBC, WBC, and platelet count. Bone marrow shows hyperplasia. What is the diagnosis = Myeloproliferative disorder
- Diffusing capacity of O2 from alveoli maximum in = Polycythemia

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216. Erythropoietin is always raised in = Sec. Polycythemia

- Polycythemia Rubra Vera is the only type of polycythemia with ↓erythropoietin and ↑ plasma volume (all others polycythemia has ↑EPO, and ↓plasma volume)

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217. Stimulus for Erythropoietin secretion is = Hypoxia

About Erythropoietin

- Primary site: Kidney (peritubular interstitial cells).
- Stimulus for secretion: Hypoxia.
  - Hypoxia ---↑ EPO synthesis --↑erythrocytes---↑O2 delivery.
- Main function: Stimulate red blood cell production.
- Inhibition: Normal oxygen levels and some pharmacological agents like theophylline
- Also remember in renal adenoma→ there would be Inc. erythropoietin

- And in end stage renal disease, anemia would be due to→ Dec. erythropoietin

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

ERYTHROPOIETIN FUNCTION AND PRODUCTION

- Erythropoietin is formed mainly by = Peritubular interstitial cells of kidney
  - It also comes as
    - Erythropoietin is secreted by = Cells in the peritubular capillary bed
    - Erythropoietin is released by which? = Kidney
- Erythropoietin is secreted by = Renal tubular epithelial cells
  - Note: Erythropoietin (EPO) is primarily secreted by peritubular interstitial cells in the kidneys, which are closely associated with renal tubular epithelial cells
- Secretion of erythropoietin is stimulated maximally by = Hypoxia
  - It is also asked as
    - In response to hypoxia, which is released? = Erythropoietin
- Erythropoietin secretion is inhibited by = Theophylline

ERYTHROPOIETIN IN CONDITIONS

- A patient suffering from end-stage renal disease presents with severe anemia. The most likely cause is = Reduced erythropoietin production
  - It also comes as
    - A patient with end-stage renal failure complains of pallor, fatigability, and lethargy for the past 3 months. Blood tests show Creat 4, Hb 7 with a normal smear. What is the most likely cause of anemia? = Erythropoietin deficiency
    - A patient with end-stage renal failure presents with worsening anemia. O/E pallor, feverish, and edema feet. What is the most likely cause of anemia? = Erythropoietin deficiency
    - A 60-year-old presents with on-and-off fever, lethargy, and dyspnea on exertion. HB 7.8, urea 140, creatinine 3 = Erythropoietin deficiency
- A middle-aged known case of ESRD on the list for hemodialysis has normochromic anemia. Which is the most appropriate therapy to be given? = IV Erythropoietin
  - It is also asked as
    - A patient with end-stage renal failure has had multiple blood transfusions for anemia. Which of the following will be helpful to reduce the number of transfusions? = Subcutaneous Erythropoietin
    - In a patient with renal failure and multiple blood transfusions, how will you treat anemia? = Erythropoietin
    - A 17-year-old with chronic renal failure has been noted to have severe anemia. What would be the most cost-effective first-line treatment? = Recombinant erythropoietin
- Right flank mass, hematuria, proteinuria likely suggests? = Increased erythropoietin
- Erythropoietin is increased in = High altitude
  - It also comes as
    - Which of the following occurs at high altitude? = Increase erythropoietin
- Erythroid stem cell generates in bone marrow under the influence of = Erythropoietin
  - Also asked as
    - The erythroid stem cells of bone marrow are active in the cell cycle and capable of self-renewal for a considerable period of time under the influence of = Erythropoietin
- Baby born at 33 weeks showing microcytic hypochromic anemia with 25% hematocrit and normal saturation. What should be given? = Erythropoietin plus formulary products containing iron
- Erythrocytosis secondary to erythropoietin is seen in = Renal adenoma
- Congenital erythropoietic porphyria with raised uroporphyrin 1 is deficient in = Uroporphyrinogen 3
- Which of the following is deficient in a child with congenital erythropoietic porphyria and raised uroporphyrin 1= Uroporphyrinogen III Synthase

- It is also asked as
    - Congenital erythrocytic porphyria main diagnostic feature is increased= Urine, stool and RBC uroporphyrinogen 1

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218. POTENT STIMULATOR OF ERYTHROPOIETIN RELEASE IS= HYPOXIA

KNOW THE DIFFERENCE.

- Potent stimulator for Erythropoiesis→ Erythropoietin
- Potent stimulator for Erythropoietin → Hypoxia

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219. A 65-YEAR LADY TREATED FOR ARTHRITIS NOW PRESENTED WITH WEAKNESS AND BRUISE. EXAMINATION REVEAL PANCYTOPENIA, 0.1% RETIC COUNT AND HYPOCELLULAR BONE MARROW WITH NORMAL CELL MORPHOLOGY. DIAGNOSIS IS= APLASTIC ANEMIA

	Aplastic anemia	Myeloproliferative disorders	MDS
Definition	Caused by failure or destruction of myeloid stem cells	Cells mature normally, but they have an abnormally high amount of proliferation—hence the name proliferative	Cells mature abnormally described as dysplastic (hence, Myelodysplastic syndromes)
Clinical features	No hepatosplenomegaly, No lymphadenopathy, or No bone tenderness and their presence should lead to questioning the diagnosis.	This leads to high numbers of cells in the blood	These dysplastic cells are often so odd and non-functional that they die. This results in lower numbers in the blood
Bone marrow & other investigations	❖ Normal cell morphology, but hypocellular bone marrow ❖ ↓ Reticulocyte count, ↑ EPO	Hypercellular in PRV Dry tap/Tear drop—Myelofibrosis	dysplastic and often normocellular/hypercellular

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- A patient with a history of Hepatitis. Bone marrow shows hypocellular with fatty changes. Diagnosis = Aplastic anemia
- The characteristic feature of aplastic anemia is = Fatty bone marrow
- A 65-year-old lady treated for arthritis now presented with weakness and bruises. Examination revealed pancytopenia, 0.1% Retic count, and hypocellular bone marrow with normal cell morphology. Diagnosis is = Aplastic anemia
- Pancytopenia with 0.1% reticulocyte count and hypocellular bone marrow in a woman treated for arthritis suggests = Aplastic anemia
- Investigation of choice for aplastic anemia = Bone marrow biopsy
- Aplastic anemia is diagnosed on = Both bone marrow aspirate and trephine biopsy
- A patient with pancytopenia. The investigation of choice is = Bone marrow biopsy
- Characteristic Feature of Myelofibrosis is = Tear drop cells
    - NOTE: Hallmark and prominent feature = Massive splenomegaly
    - Characteristic feature = Tear Drop cells > Splenomegaly
- Pelger-Huet cells are commonly found in = Myelodysplastic syndrome
- One of the following conditions can be regarded as precancerous = Myelodysplastic syndrome

- A young female taking analgesics for backache presented with bleeding gums, epistaxis. She has a fever of 101, mild jaundice, and hepatosplenomegaly. HB 9.0, TLC 7000, neutropenia, thrombocytopenia, and peripheral smear shows immature cells. What is the probable diagnosis = Drug-induced anemia
- An old person presented with fever, weakness, and lethargy. Blood shows increased RBC, WBC, and platelet count. Bone marrow shows hyperplasia. What is the diagnosis = Myeloproliferative disorder

ONCOLOGY

VIRUS ACTS ON CELLS BY = INVOLVING PROTEIN SYNTHESIS

NOTE THAT.

- Viruses cause cancer by altering oncogenes.
- Radiation causes cancer by activating proto-oncogenes into oncogenes.
- Proto-oncogenes → Oncogenes through mutations
- Radiation damages DNA, leading to proto-oncogene activation.
- Oncogenes = Mutated DNA promoting cancer.
- Proto-oncogenes = Normal genes causing cell proliferation

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

VIRUSES AND CARCINOGENESIS

- Virus causes carcinogenesis by alteration in = Protein synthesis
- Viruses cause cancer in humans by modifying = Oncogenes
    - It is also asked as
        - A virus causing bladder cancer does so by altering = Oncogenes
        - Viruses induce neoplastic changes in the cells by virtue of having = Oncogene
- Cancer in humans is due to = non-lethal damage to genes
- Some of the neoplasms appear to develop from viral oncogenesis. Which of the following neoplasms is most likely to arise in this manner? = T cell Leukemia
- Common cause of Mutation of Proto-Oncogene is = Virus (Ref: Oxford Textbook of Medicine, Volume 1 pg.: 449)

PROTO-ONCOGENES AND ONCOGENES

- Proto-oncogene to oncogene occurs by = Point mutation
- Proto-oncogene is defined as = Normal genes causing cell proliferation
- The gene not associated with oncogenesis by gene amplification is = APC

RADIATION AND CANCER

- Radiation damages the cell by free radicals which act on = DNA
    - It also comes as
        - Free radicals of ionizing radiation have their main effects on = DNA of the cell
        - Radiation damage to cells is caused by free radicals acting on = DNA
- Harmful effects of radiation are due to = Free radical formation
- The most common radiation-induced CNS tumor is = Meningioma
- Radiation entering the retina causes damage by = Photochemical mechanisms
- The organ most likely affected in a woman exposed to radiation 3–4 years ago is the = Ovary
- A thyroid nodule with papillary carcinoma is most associated with = Radiation therapy in childhood
- Ionizing radiation in bomb blast will most likely cause = Leukemia
    - It is also asked as
        - Which of the following systems is most commonly affected by radiation = Hematopoietic
        - A young male patient working in a city close to the site of an atomic reactor gets exposed to radiation due to some technical faults. The system most likely to be affected is = Hematopoietic system

- The degree of tissue affected by radiation depends on = Duration of exposure
    - It is also asked as
        - The extent of damage to tissue by ionizing radiation most likely depends on = Duration of exposure
- Radiation usually causes cancer after = 10 years
    - It also comes as
        - Carcinogenic influence of radiation most likely appears after = More than 10 years
        - Malignancy by exposure to radiation occurs after how many years? = 10 years
- Radiations cause protein damage which in turn causes oncogenesis = Bcl 2
- Common feature in ischemia, toxic, and radiation injury = Formation of reactive oxygen species (ROS)

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221. REGARDING INITIATORS AND PROMOTORS CAUSING CARCINOMA= INITIATORS FOLLOWED BY PROMOTORS CAUSING CARCINOMA

NOTE THAT

- Initiators: Cause permanent DNA damage but do not promote proliferation.
- Promoters: Enhance proliferation of initiated cells without causing DNA damage.
- Cancer occurs when initiators act first, followed by promoters

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- A group of mice were injected with plastic hydrocarbons, which act as initiators in carcinogenesis. How does the initiator function= Produces memory
- A pathologist is giving idea about cancer occurrence due to mutation in genes at various cells of cell cycle. He further tells there is a series of step by which cancer can occur. What steps are needed for cancer occurrence= Initiator followed by promotor
- Mechanism of carcinoma formation= Initiators followed by promotors causing carcinoma
- Which of the following is a QUALITATIVE increase in gene expression= Gene amplification

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222. EXAMPLE OF TUMOR SUPPRESSOR GENE=P53

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

TUMOR SUPPRESSOR GENES

- All are tumor suppressor genes except = BCL 2
- A patient on radiotherapy later develops DNA damage. A gene that normally arrests the cell cycle at G1 for repair is absent, leading to defective unregulated growth. Which of the following could it likely be? = P53
    - It also comes as
        - Gene normally arresting cell cycle at G1, absent in DNA damage? = P53
- Which of the following is a DNA repair gene? = P53
- P53 is a tumor suppressor gene. If it is absent or mutated, it most likely indicates = Cell survival
    - It also comes as
        - P53 mutation occurs. What is the mechanism of tumor genesis? = Increased cell survival
- A man was diagnosed with Li-Fraumeni syndrome. His father and brother had the same disease. Which of the following statements about Li-Fraumeni syndrome is true? = Inherited mutation in one allele of TP53
- The APC gene associated with FAP is a = Tumor suppressor gene
- Tumor suppressor gene = P53

ONCOGENES

- Which one of these is related to oncogene-related tumor? = Breast cancer

- Note:
  - Tumor suppressor gene cancers are due to loss of function.
  - Oncogene cancers are due to gain of function (e.g., HER2 in breast carcinoma).
- DNA repair genes prevent cancer. A defective DNA repair gene can lead to cancer due to= Gain of mutations
- Neoplasm due to viral oncogenesis = CML
  - It is also asked as
    - Virus causes cancer by alteration in oncogene. Which of the following is caused by such mechanism? = CML
- Burkitt lymphoma oncogenesis by EBV is via = Proto-oncogene c-myc translocation
- Girl with Hx of her sister and mother dying of metastatic breast CA before the age of 40. Which warrants high risk in her? = BRCA 1

3. CARCINOGEN FOR CANCER OF CERVIX= HPV

REMEMBER IT

Carcinogen	Organ→Example
Aromatic amines (e.g., Benzidine, 2-naphthylamine)	Bladder →Transitional cell carcinoma remember Nitrosamine—esophageal carcinoma
Arsenic	Liver → Angiosarcoma Lung →Lung cancer Skin → Squamous cell carcinoma
Asbestos	Lung→Bronchogenic carcinoma > mesothelioma
Cigarette smoke	Bladder → Transitional cell carcinoma Esophagus →Squamous cell carcinoma/adenocarcinoma Larynx→ Squamous cell carcinoma Lung → Squamous cell and small cell carcinoma
Aflatoxins (Aspergillus)	Liver → Hepatocellular carcinoma

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

CHEMICAL AND OCCUPATIONAL CARCINOGENS

- Dietary carcinogen specific for esophageal carcinoma is = Nitrosamine
- Occupational exposure of workers to aryl amine increases the risk of = Bladder cancer
- A plastic factory worker exposed to hydrocarbons presents with low-grade fever and weight loss. The likely cause is = Bladder cancer
- Which of the following is a chemical carcinogen = Benzidine
  - It is also asked as
    - The major chemical carcinogen is = Benzidine
- The carcinogenic material that has a very long latent period is = Hydrocarbon
- The most lethal chemical carcinogen is = Aflatoxin B1
- The carcinogen in cigarettes causing lung cancer is = Hydrocarbons
- Dietary carcinogen specific for esophageal carcinoma is = Nitrosamine
- Which of the following is caused by aflatoxin = Hepatocellular carcinoma
- A patient with HCC gave a history of working in a pipe factory. What is the risk factor = Vinyl chloride
- Farmer had HCC. Cause is = Aflatoxin
- An African woman with increased bilirubin, increased AFP, and a hard liver nodule likely has = Aflatoxin exposure
- A chronic smoker working in a pipe factory develops angiosarcoma of the liver. What is the risk factor = Vinyl chloride
- Dietary carcinogen specific for esophageal carcinoma is = Nitrosamine
- Which of the following is a pro-carcinogen agent = Cyclophosphamide

- One of the following agents is known to cause carcinogenesis = Nitrosamine
- The most important carcinogen causing bronchogenic carcinoma is = Tobacco smoke
- Most common Carcinogen = Chemicals
- Plastic factory worker exposed to hydrocarbons is prone to = Urinary bladder cancer
- Following carcinogen related to organ = Alcohol to liver
- A patient having HCC gave history of working in a pipe factory. What is the risk factor = Vinyl chloride
- Which of the following is caused by aflatoxin = Hepatocellular carcinoma

VIRAL AND BIOLOGICAL CARCINOGENS

- The most common biological carcinogen for AIDS-related lymphomas is = Epstein-Barr virus (EBV)
- One of the following is regarded as the most important carcinogen for the cervix = Human papilloma virus (HPV)
- Which cancer has a virus carcinogen as the cause = T-cell leukemia

ALCOHOL AND SMOKING-RELATED CARCINOGENESIS

- An alcoholic and chronic smoker develops a non-healing ulcer in the oral cavity and gum bleeding. Cause is = Squamous cell carcinoma (SCC)
    - It also comes as
        - A known alcoholic and smoker patient presented with a lesion in the oral cavity. Most likely it is = Squamous cell carcinoma
- An alcoholic patient with raised LFTs and AFP characteristic of = Hepatocellular carcinoma (HCC)
- A chronic smoker has a history of coughing and presents with altered mental status, seizures, diplopia, and difficulty in talking. MRI Brain likely shows = Metastatic cancer
- Patient known smoker presented with cerebral hemorrhage diagnosed as metastatic brain tumor. Primary site of tumor origin is = Lungs
- Liver cancer in an alcoholic and smoker with AFP > 900 ng/mL. What is the predisposing factor = Alcohol
- Patient smoker with COPD. What acts on neutrophil elastase = Nicotine
- An alcoholic and chronic smoker develops a non-healing ulcer in the oral cavity and gum bleeding. Cause is = Squamous cell carcinoma (SCC)
- A known alcoholic and smoker patient presented with a lesion in the oral cavity. Most likely it is = Squamous cell carcinoma
- An alcoholic patient with raised LFTs and AFP characteristic of = Hepatocellular carcinoma (HCC)
- A man presented with a dark-colored nodule with irregularity on the dorsum of his right hand. O/E axillary lymph nodes were palpable. The most likely cause is = Exposure to UV light
- A 65-year-old male non-smoker presents with weight loss. He doesn't give any history of fever or dyspnea. O/E supraclavicular lymph nodes are enlarged. CXR shows 1–3 cm radio-opaque shadow bilaterally. Diagnosis = Metastasis carcinoma
- A 65-year-old smoker with a history of 20 cigarettes per day for the last 20 years presented with mild upper respiratory infection. Biopsy of alveoli will show = Squamous metaplasia

KNOWN THE DIFFERENCE

- A smoker working in a plastic factory presents with painless hematuria & atypical urothelial cells. Diagnosed as bladder Ca. What is the most likely cause=Smoking
- A chronic smoker is working at a tire factory. He develops painless hematuria and was diagnosed as bladder Ca. What is the cause of carcinoma in him=Smoking
- A nonsmoker pt. presented with chest heaviness, cough and hemoptysis on investigations he was diagnosed as a case of lung cancer. Which of the following environmental agent exposure leads to his disability= Radon
- An old man with no other risk factors had non-productive cough for 2 months. Now presented with blood-streaked sputum. O/E he has bilateral wheeze. CXR shows 5 cm hilar mass in the left lung with hemorrhagic pleural effusion. Sputum shows hyper chromatic, pleomorphic cells with scanty cytoplasm. What is the most likely cause=Radon exposure

- ✓ (Ref F Aid general patho, Radon second leading coz of lung CA after smoke, and there is no history of asbestos exposure)
- ✓ In such scenario if person is smoker prefer smoking---otherwise radon

KNOWN THE DIFFERENCE

- A 60-year male factory worker presented with ascitic. Ascitic fluid was hemorrhagic and contained malignant cell. Liver biopsy showed angiosarcoma. The most probable cause is=Vinyl chloride
- Hepatic angiosarcoma is associated with which of the following = Vinyl chloride
- A 60-year farm worker presented with ascitic. Ascitic fluid was hemorrhagic and contained malignant cell. Liver biopsy showed Angiosarcoma. The most probable cause is=Arsenic
  - For both these questions remember
    - ✓ If factory worker mentioned---then vinyl chloride
    - ✓ If farm worker mentioned---then arsenic

224. DIAGNOSTIC TUMOR MARKER FOR OVARIAN CA = CA-125

FOR TUMOR MARKERS REMEMBER

- Tumor markers are used to detect recurrence and response to therapy
- For tumor diagnosis use→ biopsy

Marker	Associated Cancer	Notes
Alkaline phosphatase	Bony or liver metastasis Paget disease of bone Seminoma	
α-fetoprotein	Hepatocellular carcinoma. Yolk sac (endodermal sinus) tumor Mixed germ cell tumor.	Normally made by fetus. Transiently elevated in pregnancy. High levels →neural tube defects Low levels →Down syndrome.
β-hCG	Hydatidiform moles Choriocarcinomas (Gestational trophoblastic disease) Testicular cancer (seminoma, embryonal carcinoma)	β- hCG is produced by Syncytiotrophoblast of the placenta. Mnemonic= **S**yncytiotrophoblast= **S**ynthesizes and **S**ecretes hCG
CA 15-3	Breast cancer	
CA 19-9	Pancreatic adenocarcinoma	
CA 125	Ovarian cancer	
CEA	Colorectal cancer Pancreatic cancer. Minor association with breast cancer	
PSA	Prostate cancer	
Calcitonin	Medullary Thyroid cancer	

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Most common method to detect circulating tumor cells in blood = Tumor markers.
- The most widely used technique for detecting circulating tumor cells is = Reverse transcriptase PCR

THYROID

- Calcitonin is a tumor marker for = Thyroid
- Anterior resection of 3 cm of thyroid carcinoma. On H/P cells take up Congo-red stain. Tumor marker for prognosis is = Calcitonin
- A woman with dysphagia, on/off diarrhea, hoarseness of voice, and metastasis to cervical lymph nodes. The tumor marker involved is = Calcitonin

- A 30-year-old woman presented with an enlarged thyroid with dysphagia and hoarseness of voice. Thyroidectomy revealed a tumor containing abundant pink hyaline material positive with Congo red stain. The tumor marker most useful for follow-up would be = Calcitonin
    - It is also asked as
        - A middle-aged female presented with a metastatic tumor in her cervical lymph node. She also had hoarseness of voice and mild dysphagia with off-and-on diarrhea. Histopathological examination of the lymph node showed amyloid around tumor cells. The serum tumor marker to confirm the diagnosis would be = Calcitonin
        - A 30-year-old woman presented with an enlarged thyroid with dysphagia and hoarseness of voice. Thyroidectomy revealed a tumor 3 cm in diameter. The tumor contained abundant pink hyaline material positive with congo red stain. The tumor marker most useful for follow-up would be: = Calcitonin
        - A middle-aged female presented with a metastatic tumor in her cervical lymph node. Histopathology shows amyloid around tumor cells. The serum tumor marker to confirm the diagnosis would be = Calcitonin
- Cells activity enhanced by which marker= IL 2 (IL-2 enhances the activity of T-cells and NK cells)
- Anterior resection of 3cm of Thyroid carcinoma. On H/P cells take up Congo-red stain. Tumor marker for prognosis is= Calcitonin

OVARY

- Tumor marker for ovarian cancer = CA 125
- A young girl presented with fatigue and weight loss. O/E she had ascites, right-sided pleural effusion, and an abdominopelvic mass. U/S confirmed a mass in the ovary. Which marker is likely to be raised = CA 125
- Carcinoma of ovary on staining hyperchromatic cells. Tumor marker is = CA 125
- Female diagnosed as a case of ovarian cancer with ascites present. Tumor marker will be = CA 125
- Young unmarried female has an abdominopelvic mass. Chest X-ray shows metastasis. Tumor marker = CA 125
- A 50-year lady presented with fatigue and weight loss. O/E she had ascites, right-sided pleural effusion and an abdominopelvic mass. U/S confirmed a mass in the ovary. Which marker is likely to be raised? = Ca-125
- Unmarried 18-year-old female has a mass protruding up to the umbilicus. CT shows chest metastases. Tumor marker = CA 125

BREAST

- Tumor marker of breast carcinoma = CA 15-3
- Tumor marker for ovarian cancer is raised in which other organ = Breast
- One of the following markers is diagnostic in most cases of ovarian cancers: = CA-125

COLON

- Major tumor marker for colon cancer is = CEA
- After hemicolectomy of the left colon for cancer, the marker to monitor recurrence is = CEA
- Colon cancer surgery done, no metastasis present. Colon cancer marker = CEA
- Antigen found in high concentration in plasma of normal fetuses and in patients with progressive colon cancer = CEA
- Diagnosis of emaciated woman with loss of appetite, diarrhea, ALK 133, AFP 2, bilirubin 16, CEA 30, raised GGT = Colon cancer
- Which tumor marker is raised 60% in pancreatic cancer, 80% in colon cancer, and in cholangitis = CEA
- The best prognostic and follow-up indicator in Dukes B stage carcinoma is serum level of = Carcinoembryonic antigen levels
- An antigen found in relatively high concentration in the plasma of normal fetuses and a high proportion of patients with progressive carcinoma of the colon is most likely = Carcinoembryonic antigen

- In 60-year male left hemicolectomy done due to DUKE B tumor with no liver metastasis. The prognostic level which should be measured is = CEA
- Tumor marker for a person with colon carcinoma & no liver metastasis=Carcinoembryonic

LIVER

- In hepatocellular carcinoma, tumor marker is = Alpha fetoprotein (AFP)
- Embryonal tumor marker for HCC is = AFP
- Oncofetal tumor marker in hepatocellular carcinoma = Raised Alpha fetoprotein
- A 60-year-old cirrhotic male presented with multiple tumor nodules in his liver. Biopsy showed an adenocarcinoma. Which of the following tumor markers will confirm this to be of primary origin = Alpha-fetoproteins

MARKERS FOR HEMATOLOGIC AND OTHER CAUSES

- Tumor marker for acute lymphoblastic leukemia (ALL) = CD 10
- Tumor marker for B cells = CD 19/CD 20
- Tumor marker of astrocytoma = GFAP
- How to differentiate hematopoietic stem cells in myelocytic stage = CD 34 positive
- Most specific marker of neural tube defects = Acetylcholinesterase > AFP
- Assessment of muscle injury is done by which marker = CK-MM
- Cells activity enhanced by which marker = IL-2 (enhances T-cell and NK cell activity)
- Oat cell carcinoma tumor marker = ACTH
- In meningomyelocele, the marker most likely elevated is = Alpha-fetoprotein (AFP).

OTHERS

- All are markers for osteoblastic activity except=Hydroxyproline (while markers are Alkaline phosphatase, Osteocalcin, Bone scan)
- Prostate marker released. Sample taken from which structure= Urogenital sinus
- Assessment of muscle injury is one by which marker=CK-MM
- Pregnant 6 weeks HCG positive RIF pain= ectopic pregnancy
  - Note that
  - Mean serum β-HCG levels are lower in ectopic pregnancies than in healthy pregnancies
- Pregnant Female present at 20 weeks gestation with bleeding and passage of vesicles= Beta HCG raised

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25. TESTICULAR TUMOR SCENARIO, WHAT WAS THE MARKER = AFP

NOTE THIS

- Seminoma: ↑ placental ALP, ↑ hCG, Fried egg appearance.
- Embryonal Carcinoma: ↑ hCG.
- Yolk Sac Tumor: ↑ AFP, Schiller-Duval bodies.
- Teratoma: Malignant in adults, benign in children.
- Choriocarcinoma: ↑ hCG.
- Leydig Cell Tumor: Reinke crystals, ↑ Androgen/Estrogen

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Enlarged testis with increased serum AFP suggests = Embryonal carcinoma
- A male presented with testicular mass with elevated AFP = Embryonic carcinoma
- A 20-year-old man has a testicular mass, which on orchiectomy shows a malignant tumor with yolk sac differentiation. Marker most useful for monitoring recurrence = Alpha-fetoprotein
- A 20-year-old man has a testicular mass, which on orchiectomy shows a malignant tumor with yolk sac differentiation. Which of the following markers would probably be most useful in monitoring the patient for recurrent or metastatic disease = Alpha-fetoprotein

- A clinical study is performed using subjects diagnosed with testicular neoplasia. The laboratory findings of these subjects are reviewed. A subset of these subjects is found to have an elevated serum alpha-fetoprotein. Which of the following types of testicular neoplasm is this subset of men most likely to have had = Seminoma
- A group of males were taken for a study of neoplasia. That group was positive for alpha fetoproteins. Which neoplasia is likely to be positive for these men = Embryonal carcinoma
- Enlarged testis with increased serum alpha-fetoprotein (AFP) suggests = Embryonal carcinoma
- A young male has a solid, firm, non-hemorrhagic mass in the right testis. His serum AFP and HCG are normal. Most likely tumor = Seminoma
- A tumor that secretes excessive estrogen is most likely a = Granulosa cell tumor
- Seminoma in the young male = has a 5-year cure rate of over 90%.
- A young male has a solid firm non-hemorrhagic mass in the right testis. His serum AFP and HCG are normal. It was resected and the patient is treated with radiotherapy. The most likely tumor is = Seminoma
- An old man presented with complains of testicular swelling. Labs show increased ldh. Diagnosis=testicular lymphoma
- A known HIV pt who presents with abdominal obstruction and pain. Investigation revel intestinal mass which was resected. Most likely cause was= Lymphoma
- A 55yrs old male presents with painless testicular swelling. Labs show increased LDH. Which if the most likely diagnosis= Lymphoma
- A 60-year man with testicular swelling. Biopsy shows mature specialized cells. Diagnosis is= Teratoma
- Testicular mass with mature cells and tissues and all 3 germ layers Diagnosis=Teratoma
- An epidemiologic study is performed to determine potential risk factors for development of penile squamous intraepithelial neoplasia. It is observed that persons who develop this disease are elderly men. The medical histories of these men are reviewed. Which of the following diseases is most likely to be found to precede development of penile neoplasia in these men = Phimosis

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226. FREQUENTLY ASSOCIATED WITH PARANEOPLASTIC SYNDROME= SMALL CELL LUNG CA

ALSO REMEMBER THAT.

Cushing syndrome	↑ ACTH	Small cell carcinoma of the lung.
SIADH	↑ ADH	Small cell carcinoma of the lung.
Hypercalcemia	↑ PTHrP (parathyroid hormone related protein)	Squamous cell carcinomas of lung head, and neck
Polycythaemia	↑ Erythropoietin	Renal Cell Carcinoma Pheochromocytoma

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Ectopic parathyroid hormone produced by= sq. cell CA of larynx
- A man was found to have history of smoking multiple packs per day, has developed small cell carcinoma (oat cell). Which will be secreted by it= ACTH
- In small cell (oat cell) lung carcinoma which tumor marker is present= ACTH
- Which of following is associated with Paraneoplastic syndrome= Small cell CA lung
- Paraneoplastic syndrome associated with renal cell carcinoma= Polycythemia
- A 50 yr. old man having aching pain in right flank and hematuria. Blood urea, nitrogen S. electrolytes and RFTs were normal. Hb 18 and serum Ca 11. On imaging there is a mass in right flank. Diagnosis= Renal cell carcinoma
- Small cell Ca lung causes= SIADH

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227. PERSON CHEWING PAN AND BATTLE, WHICH COMPLICATION MAY OCCUR= SUBMUCOSAL FIBROSIS

REMEMBER

- Premalignant Lesion (Most common): Leukoplakia

- Premalignant Lesion (Most lethal): Erythroplakia
- Betelnut chewing: Submucosal fibrosis
- Premalignant conditions= Submucosal fibrosis, Squamous papilloma, Actinic keratosis, Barret esophagus
- Premalignant lesion cause= chronic ulcers

NOW LET'S DISCUSS SOME PAPER MCQ'S

PREMALIGNANT LESIONS OF THE ORAL CAVITY

- Which of the following is a premalignant lesion in the mouth? = Lichen planus
  - It is also asked as
    - Premalignant condition among the following = Lichen planus
    - Which of the following is a premalignant lesion in mouth= Lichen planus
    - Which of the following is a premalignant lesion of oral cavity = Lichen planus
    - The risk of Lichen planus changing into malignancy is= 10-15%
- Premalignant lesion associated with years of eating pan = Submucosal fibrosis
  - It also comes as
    - Oral submucosal fibrosis is defined as = Premalignant lesion
    - Patient uses smokeless tobacco and develops submucosal fibrosis. It is = Premalignant
- Most common cause of premalignant change in the mouth in adults = Chronic ulcer
- Premalignant lesion of the vulva is = Paget
  - It is also asked as
    - A young female presents with complaints of an elevated lesion on the vulva. Biopsy suggested a premalignant lesion. What is the most likely diagnosis? = Paget disease
  - It also comes with different options
    - One of the following vulvar lesions is premalignant = Squamous papilloma
- Which of the conditions is premalignant? = Barrett esophagus
  - It is also asked as
    - The most common premalignant condition of esophageal cancer is = Barrett esophagus
- One of the following lesions is a premalignant lesion = Dysplasia
- The most common premalignant lesion in the skin is = Junctional nevus
- Which of the following is a premalignant condition? = Dysplastic nevus
- Most common cause of premalignant change in mouth in adults=Chromic ulcer
- The most common pre-malignant condition of the oral cavity is = LeuKoplakia
- The most lethal pre-malignant condition of the oral cavity is = ErythroplaKia

OTHER PREMALIGNANT CONDITIONS

- A 45-year-old woman presents with vaginal bleeding after an abortion and is advised to have a hysterectomy due to a premalignant condition. The likely diagnosis is = Atypical endometrial hyperplasia
  - It is also asked as
    - A 45-year-old lady comes with vaginal bleeding after an abortion for which dilatation and curettage was done. Her gynecologist advised a hysterectomy due to a premalignant condition on histology. The most likely diagnosis is = Atypical endometrial hyperplasia
- Diagnostic criteria for a premalignant condition is = Increase N/C ratio
- Premalignant lesion of the vulva is = Paget
  - It also comes as
    - A young female presents with complains of an elevated lesion on vulva. Biopsy suggested a premalignant lesion. What is the most likely diagnosis=Paget disease
  - It also comes with different options
    - One of the following vulvar lesions is premalignant= Squamous papilloma
- Which of the following cancers never metastasizes? = Basal cell carcinoma

228. GREATER CHANCES OF SQUAMOUS CELL CARCINOMA OCCUR IN= BOWEN DISEASE

NOTE THAT

- Premalignant lesion which leads to SCC is= Bowen's disease
- Premalignant lesion which leads to SCC and needs EXCISION is= Actinic keratosis

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Premalignant lesion at face, around cheek. What is your diagnosis= Actinic keratosis
- Scenario of a skin lesion described as irregular brown colored lesion with hyperkeratosis, parakeratosis, and atypical cells on forehead of a farmer. The likely diagnosis is= Actinic keratosis
- The most common factor which predisposes to squamous cell carcinoma of the skin is = Bowen's disease
    - It also comes as
        - Most common precursor to Squamous cell carcinoma= Bowen's disease
        - Which of the following is an important premalignant lesion leading to SCC= Bowen disease
- A malignancy causing a skin lesion is = Bowen's disease.
- One of the following lesions is most likely to develop into malignancy= Bowen's disease

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229. CHARACTERISTIC FEATURE OF MALIGNANCY= INVASION

REMEMBER

- Characteristic feature of malignancy= Metastasis > invasion > pleomorphism
- Most important diagnostic feature of malignancy= Metastasis
- Difference b/w hyperplasia and benign tumor is= capsule
- Difference b/w malignant and benign tumor is= metastasis

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- The most important diagnostic feature of malignancy is = Metastasis
    - It also comes with different option so remember the sequence (Metastasis > invasion > pleomorphism)
        - A study analyzing characteristics of malignant neoplasms in biopsy specimens concludes that the most diagnostic microscopic criteria for malignancy is = Invasion of adjacent tis
        - Hallmark of malignancy is = Invasion
        - The most characteristic feature of a malignant tumor is = Metastasis
        - What is the most important diagnostic feature of malignancy? = Metastasis
        - An unequivocal feature of malignancy is = Metastases
        - What is microscopic feature of malignancy? = Invasion of adjacent tissue
        - The most important feature distinguishing benign from malignant tumors is = Metastasis
        - Histopathology of malignancy = Invasion of basement membrane
        - Carcinoma of the cervix is diagnosed by = Invasion of the basement membrane
        - A 55-year-old woman with a 3 cm right adrenal mass excised and showing features resembling adrenal cortex. The most reliable indicator of malignancy = Invasion
        - The most diagnostic microscopic criteria for a malignant tumor = Invasion of adjacent t
- The most reliable feature that differentiates malignant from benign tumors is = Invasiveness
- A slow-growing, painless mass in the superficial lobe of the parotid gland with pseudopods and no capsule is likely to be = Pleomorphic adenoma
- The most reliable microscopic feature for the diagnosis of a precancerous lesion of the cervix uteri is = Nuclear pleomorphism
- A biopsy showing increased nuclear cytoplasmic ratio, pleomorphism, and mitotic figures without invasion is = Carcinoma in situ

- Mechanism of tumor metastasis = Downregulation of E-cadherin
    - It also comes as
        - One of the most important mechanisms promoting tumor metastasis is = Degradation of E-cadherin
- The tumor usually associated with nerve sheath invasion is = Adenoid cystic carcinoma
- A characteristic feature of follicular carcinoma of the thyroid gland is = Vascular invasion
    - It also comes as
        - Characteristic feature on FNAC of follicular carcinoma of thyroid = Capsule invasion
- Histopathologic finding of grade 3 tumor is = 50-75% undifferentiated

SPECIFIC TUMOR TYPES

- The tumor usually associated with loose dimples in breast cancer is = Cancer invasion and fibrosis
    - It also comes as
        - Orange peel appearance in breast cancer is primarily caused by = Cancer invasion fibrosis
- Cervical cancer 3.5 cm, homolateral lymph node enlarged, palpable with suspected metastasis, TNM classification = T2N1M1
- One of the following tumors usually does NOT cause distant metastasis = Basal cell carcinoma
- A 50-year-old female with breast cancer undergoes radical mastectomy and later presents with a lump in the breast. The probable cause = Metastasis
- A male child with left testis in the mid-inguinal region and right in the scrotum is at risk of = Malignancy
- A 45-year-old woman with a cervical biopsy showing increased nuclear cytoplasmic ratio, pleomorphism, and mitotic figures without invasion = Carcinoma in situ
- Histology slide shows features of squamous cell carcinoma (drop-shaped rete-ridges, nuclear pleomorphism, invasion) = Squamous cell carcinoma
- A Male child having left testis in mid inguinal region, right in scrotum is at risk of= Malignancy

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230. CARCINOMA HAVE FOLLOWING INTERMEDIATE FILAMENT= KERATIN

NOTE THE FOLLOWING.

- Keratin= Carcinoma
- Intermediate filament in carcinoma= cytokeratin
- Intermediate filament in muscle= desmin
- Intermediate filament connective tissue cells=Vementin

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Cytokeratin stains for what purpose = Carcinoma
    - It also comes as
        - On staining, cytokeratin indicates = Neoplasia
        - Diagnosis of epithelial tumor is based on the presence of = Cytokeratin
        - Cytokeratin staining is useful for = Determining neoplasm as cancer
- Most carcinoma contain which intermediate filament = Cytokeratin
    - It also comes as
        - Cytokeratin is an example of = Intermediate filament
- In carcinoma, which filaments are present = Keratin
    - It also comes as
        - Carcinoma have the following intermediate filament = Keratin
        - Most common filament in carcinoma = Keratin
        - Most of the carcinomas contain one of the following Intermediate filaments = Keratin
- Cytokeratin staining is useful for = Determining neoplasm as cancer

- In an experiment, a series of immunohistochemical stains are employed to identify different cellular components. The cytokeratin stain is most likely useful for = Determining if a neoplasm can be classified as a carcinoma
- Which of the following is a marker of carcinoma = Keratin
- Well-differentiated squamous cell carcinoma = Keratin
  - It also comes as
    - Characteristic feature of squamous cell carcinoma = Epithelial nest of keratin
    - Feature of a well-differentiated squamous cell carcinoma = Keratin pearls

MUSCLE-RELATED FILAMENTS

- Muscle has the following = Desmin
  - It also comes as
    - The intermediate filament present in muscle is = Desmin
    - A mass lesion in the thigh with polymorphous cells, and the increased marker is = Desmin
- Which intermediate filament is present more in muscle connective tissue cells = Vimentin
- A 49-year-old man with a 15 cm solid mass in the thigh composed of highly pleomorphic spindle cells. Immunohistochemical marker likely demonstrated = Vimentin

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231. WHICH IS NON-MALIGNANT= HAMARTOMA

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

MALIGNANT TUMORS

- The most common malignant tumor in children is = Medulloblastoma
- The most likely cause of anemia in a malignant tumor is = Hemorrhage
- Malignant tumors do NOT cause anemia by = Intravascular hemolysis
- Which of the following terms refers to a malignant tumor of mesenchymal tissue? = Sarcoma
- One of the following tumors is malignant = Glioma
- The most common malignant tumor of bone in the second decade of life = Osteosarcoma
- The most aggressive neoplasm in its behavior is = Melanoma
- Malignant melanoma = Xeroderma pigmentosum
- Melanoma invades the orbital cavity through = Emissary vein
- A patient with a history of positive colon cancer was diagnosed with a polyp. Which of the following transforms into malignancy = Adenomatous polyposis

BENIGN TUMORS

- One of the following is a benign tumor = Leiomyoma
- Most common benign tumor of the pancreas = Cystic adenoma
- The most common germ cell tumor of the ovary is = Benign teratoma
- The most common benign tumor in the GIT arises in = Smooth muscle
- Which of the following is a benign tumor = Warthin
- Most common benign tumor of the salivary gland is = Pleomorphic adenoma

LOCALLY MALIGNANT TUMORS

- Example of a locally malignant tumor is = Ameloblastoma
- A multinodular radiolucency on a radiograph from the mandibular molar area is pathognomonic for = Ameloblastoma

TUMORS WITH SPECIFIC CHARACTERISTICS

- A pt with a circumscribed renal mass with variegated appearance = Renal cell carcinoma
- Hamartoma is defined as = Mass of mature disorganized tissue indigenous to that organ
- The tumor usually associated with nerve sheath invasion is = Adenoid cystic carcinoma

232. CHANGE IN SIZE, SHAPE AND POLARITY IS= DYSPLASIA

Dysplasia	○ Pleomorphism → Abnormal proliferation of cells with loss of size, shape, and orientation
Carcinoma in situ/ preinvasive	○ Neoplastic cells have not invaded the intact basement membrane. ○ ↑ Nuclear: cytoplasmic ratio and clumped chromatin.
Invasive carcinoma	○ Cells have invaded basement membrane using collagenases and hydrolases (metalloproteinases). ○ Cell-cell contacts lost by inactivation of E-cadherin.
Metastasis	○ Spread to distant organ via lymphatics or blood

NOW LET'S PRACTICE SOME PAPER MCQS

DYSPLASIA AND RELATED FEATURES

- Dysplasia is mainly seen in = Epithelium
- The characteristic feature of Dysplasia = Loss of polarity and architecture
  - It also comes as
    - Change in shape, size, and polarity occurs in = Dysplasia
    - Reversible disorderly maturation with variability in size, shape, and polarity of cells is known as = Dysplasia
    - Feature of dysplasia = Loss of polarity and architecture
- A sequence of epithelial metaplasia to dysplasia and to carcinoma-in-situ would be most characteristic for = Human papillomavirus infection of the uterine cervix
  - It also comes as
    - The most important etiological agent for the development of Dysplasia in the cervix is = Human Papillomavirus (HPV)
    - A patient diagnosed on Pap smear as dysplasia with nuclear chromasia and koilocytes. The virus involved is = HPV
    - A 40-year-old woman diagnosed with dysplasia on Pap smear, showing nuclear chromasia and koilocytes. The virus likely involved is = Human papillomavirus (HPV)
- Pap smear of an 18-year-old girl shows mild dysplasia in the cervix. Which grade is it? = CIN 1
  - It also comes as
    - Pap smear findings, nuclei large present. Advice to do Pap smear after 6 months = Dysplasia
    - A female with infection of HPV comes after 2 years. Her pap smear shows prominent nuclei and increased nucleus size. Diagnosis = Dysplasia
    - Pap smear of a young female patient shows evidence of human papillomavirus infection. After two years, the pap smear shows epithelial cells with enlarged nuclei and prominent nucleoli. The process likely in this patient is = Dysplasia
    - A patient called for follow-up. Pap smear showed atypical giant cells with nuclear chromasia and koilocytes. What condition is the patient likely suffering from? = Dysplasia
    - A patient with cervical dysplasia is suspected to have cervical cancer. Which of the following tests is advised initially that is easily performed, useful, safe, and cost-effective? = Pap smear
- The usual site of fibrous dysplasia is = Maxilla
- A 45-year-old woman with extreme hypertension and bilateral small kidneys at autopsy likely had = Fibromuscular dysplasia

233. CERVICAL DYSPLASIA CAUSE BY=MULTIPARITY

REMEMBER

- Most common cause of cervical dysplasia=HPV

- Most common cause of cervical metaplasia= Multiparity
- Failure rate of IUCD is= Less than 1%
- The most common complication of IUCD is=Irregular vaginal bleed
    - Sometimes irregular vaginal bleed option is not given, go for ---Purulent vaginal discharge.

234. MOST RADIOSENSITIVE TUMOR STRUCTURE ARE= LYMPH NODE

SOME PREVIOUS PAPER MCQS

- ✓ Most common radiation related brain tumor is=Meningioma
    - Question was about cancer arising after radiation. Another question is frequently asked about sensitivity of cancers when treated by radiation .in that case its lymphoma> seminoma> craniopharyngioma > Glioma, hence read the stem carefully.
    - Most radiosensitive tumor in order are = Lymphoma> seminoma> craniopharyngioma > Glioma
- ✓ Most radiosensitive tumor=Seminoma
- ✓ Radiation usually cause cancer after=10 years
- ✓ Most sensitive to radiation is=Lymph node
- ✓ Ionizing radiation in bomb blast will most likely cause=Leukemia
- ✓ Which of following system is most commonly affected by radiation=Hematopoietic
- ✓ A known Papillary Tumor female recently diagnosed come to your OPD with no previous hx or cause. What is the most likely risk factor causing the tumor=Radiation in childhood
- ✓ A Pt underwent radiotherapy as treatment process for carcinoma. He presents few days later with skin ulceration and fibrosis. Cause is= Desquamation

235. STAGING FOR ANY MALIGNANCY IS DONE TO SEE=EXTEND OF SPREAD

KNOW THE DIFFERENCE.

- ✓ Grading= differentiation and mitotic activity on histology
- ✓ Staging= degree of localization/ spread

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ To know the degree of differentiation, which of the following is done=Grading
- ❖ Grading of a tumor shows=Nuclear Differentiation
- ❖ Grading of tumor means=Degree of differentiation/Anaplasia
- ❖ Grading in cancer determines = Number of mitotic divisions in cancerous cells
- ❖ Staging is a method of determining=Spread to other areas
- ❖ Staging for any malignancy is done to determine=Extend of spread
- ❖ A Cervical tumor of mass 3.5cm, ipsilateral cervical node enlarged and mobile with suspected metastasis and involving distant organs as well. What is the staging=T2, N1, M1
- ❖ Most helpful prognostic indicator in CA colon = Staging of disease
- ❖ Staging of a malignant tumor depends upon = Extent of invasion
- ❖ Staging shows = Extent of invasion

236. SMOKER WITH NON-HEALING RAISED IRREGULAR BORDERED ULCER ON LOWER LIP WITH PALE MARGINS. DIAGNOSIS= SQUAMOUS CELL CARCINOMA

NOTE

- ✓ Basal cell carcinoma is (Boss) present on upper lip
- ✓ Squamous cell carcinoma is (secretary) so present on lower lip

ALSO REMEMBER

- ✓ Lower lip is derived from= Mandibular prominence
- ✓ Most common intraoral site of basal cell carcinoma= buccal mucosa

- ✓ A 20-year-old boy presents with a bald patch on the scalp since birth. On examination, there is a yellowish patch with a smooth velvety surface. Histopathology revealed epidermal papillomatosis and numerous sebaceous glands situated at a high level in the dermis. Serious complications of this lesion are: = Basal cell carcinoma
- ✓ Which eye tumor has the least potential to metastasize? = Basal cell carcinoma
- ✓ The commonest type of basal cell carcinoma is = Nodular

237. LOW DOSE ESTROGEN PILL CAUSES. = HEPATIC ADENOMA

NOTE THE DIFFERENCE HERE.

- If asked Estrogen containing OCPs = Inc. risk of Thromboembolism > Breast CA
- If asked High Estrogen containing OCPs= Inc. risk of endometrial CA
- If asked Low Estrogen containing OCPs= Inc. risk of Hepatic Adenoma
- Non-Contraceptive benefit of contraceptive pills= Prevention of ovarian cancer
- Prolonged exposure to estrogen inc risk for= thromboembolism

NOW LET'S SOLVE SOME PAST PAPER MCQ'S

- A post-menopausal woman taking Estrogen for prevention of osteoporosis. She is at risk of=Thromboembolism
- A Women taking HRT for 10 years gives history that her sister died of breast Ca. She is at risk of developing=Breast CA
- A female taking estrogen therapy to relieve post-menopausal symptoms will likely have increased risk of=Thromboembolism
- Prolong use of Estrogen will increase risk of=Thromboembolism
- Long term risk of estrogen use=DVT (Inc. risk of Thromboembolism > Breast CA)
- Common complication of estrogen therapy is= Thromboembolism
- Long term complication of estrogen use= DVT
- A post-menopausal woman 5 yrs presented with bleeding. USG shows endometrial thickness more than 12mm. Most likely diagnosis is=Endometrial Ca
- A female taking estrogen therapy to relieve post-menopausal symptoms will likely have increased risk of=Thromboembolism
- Most serious complication of estrogen in postmenopausal women=Endometrial CA
- MOA of OCP is=Inhibit FSH
- The non-contraceptive benefit of contraceptive pills is=Prevention of ovarian cancer

238. WHICH OF THE FOLLOWING CHROMOSOMAL TRANSLOCATIONS IS ASSOCIATED WITH PHILADELPHIA CHROMOSOME= CHROMOSOME 9 & 22

REMEMBER

t(8;14)	Burkitt lymphoma (c-myc activation)
t(9;22) (Philadelphia chromosome)	CML (BCR-ABL hybrid)
t(14;18)	Follicular lymphoma (BCL-2 activation)
t(15;17)	M3 type of AML

NOW LET'S PRACTICE SOME PAPER MCQ'S

LEUKEMIA

- Philadelphia chromosome associated with= CML
- Old patient with raised absolute WBC count. What would you prefer? = Bone marrow aspiration
    - o Note that---Aspirate has a high specificity; its sensitivity depends on the disease. Biopsy is mandatory in most cases.

- A patient with thrombocytopenia, petechiae, bleeding from gums, ulceration of the lower lip with paresthesia was advised full blood count and bone marrow biopsy. Most likely diagnosis is = Leukemia
- A 60-year-old patient with 8 months history of low Hb, mature-looking lymphocytes, WBC 59×10^9, and general lymphadenopathy. Diagnosis = Chronic lymphocytic leukemia (CLL)
- A pt with thrombocytopenia. petechie bleeding from gums, ulceration of lower lip with paraesthesia was advised full blood count and bone marrow biopsy. Most likely diagnosis is= Leukemia

CHROMOSOMAL TRANSLOCATION

- Translocation of t (8:14) involving c-myc gene results in= Burkitt lymphoma
- A male presented with fever and cervical lymphadenopathy, he was diagnosed as a case of Burkett's lymphoma. Which of the following is associated with his condition? = 8:14
- Chromosomal translocation of follicular lymphoma=14:18
- The chromosomal translocation of acute myeloid leukemia is= 8: 21
- 9:22 translocation occurs in=CML
- 8:21 translocation occurs in=AML
- A 50-year-old man presented with Hb 8.2, raised WBC, platelet count, and massive spleen reaching up to T10. Peripheral smear showed multiple immature myeloblasts. What is the genetic defect? = 9:22
- Cytogenetic analysis of cells obtained via bone marrow aspiration for a 52-year-old female with splenomegaly and WBC 189,000/microliter shows = 9:22

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239. IN HODGKIN LYMPHOMA THE MALIGNANT CELL IS = REED STERNBERG CELLS

HODGKIN LYMPHOMA SUBTYPES

- Nodular Sclerosis: Most common, Reed-Sternberg + fibrotic bands, Excellent prognosis.
- Mixed Cellularity: 2nd most common, Reed-Sternberg (no bands), Intermediate prognosis.
- Lymphocyte Rich: Older males, Reed-Sternberg + abundant lymphocytes, Good prognosis.
- Lymphocyte Depleted: Older males, Reed-Sternberg + diffuse fibrosis, Worst prognosis.
- Lymphocyte Predominant: Young males, popcorn cells, best prognosis

NOW LET'S SOLVE SOME PAST PAPER MCQ'S

HODGKIN'S LYMPHOMA

- Most common type of Hodgkin's lymphoma = Nodular sclerosis
- Scenario of Hodgkin's lymphoma with lacunar cells. Type of Hodgkin is = Nodular sclerosing
- Hodgkin's disease type with the best prognosis = Lymphocyte predominant
- Hodgkin lymphoma with involvement of supraclavicular node and mediastinal lymph node on the same side of the diaphragm. Which stage is this? = II A
- Reed-Sternberg cells with mixed cellularity indicate = Hodgkin's disease
- A child with fever, cervical lymphadenopathy. Peripheral film shows atypical lymphocytes with binuclear enlarged cells with granules. CD15 and CD30 also positive. Diagnosis = Hodgkin lymphoma
- A patient of Hodgkin's disease developed fever and neck rigidity. The CSF culture yielded growth of a fungus. The organism most likely to be associated is = Cryptococcus

NON-HODGKIN'S LYMPHOMA

- A male presented with fever and cervical lymphadenopathy. He was diagnosed as a case of Burkitt's lymphoma. Which of the following is associated with his condition? = 8:14
- A patient HIV positive for 10 years presents with abdominal obstruction and pain. Scan shows intestinal mass, which is resected and shows infiltrating and invading tumor most likely = B-cell lymphoma
- The most likely diagnosis for a patient with numerous crowded follicles of small, monomorphic lymphocytes in cervical lymph node biopsy = Poorly differentiated lymphocytic lymphoma

DIAGNOSTIC FEATURES

- In Hodgkin's disease = Spread tends to be by contiguous extension

- It is also asked as
    - Regarding Hodgkin lymphoma, true is = Contiguous lymphatic spread
- CSF examination is important to rule out = Lymphoma
- Histologically, lymphoma is diagnosed by = Immunohistochemistry
- In Hodgkin Lymphoma, the malignant cell is = Reed-Sternberg cells
- Histologically, lymphoma is diagnosed by = Immunohistochemistry

240. C-MYC GENE DISRUPTION IS ASSOCIATED WITH= BURKITT LYMPHOMA

NOTE

- C-MYC: Burkitt's lymphoma
- N-MYC: Neuroblastoma
- L-MYC: Small cell lung cancer

ALSO REMEMBER THESE MCQS

- Burkitt lymphoma oncogenesis by EBV is via = Proto-oncogene c-myc amplification
    - It also comes as
        - C-Myc gene translocation is seen in = Burkitt lymphoma
        - A 30-year-old female with a neck mass diagnosed as high-grade B-cell lymphoma with c-myc translocation. Virus involved is = EBV
- Translocation of t(8:14) involving c-myc gene results in = Burkitt lymphoma
- Neuroblastoma tumor is characterized by = Amplification of the N-myc oncogene
    - It also comes as
        - N-Myc gene mutation is associated with = Neuroblastoma
- Which amongst these is a childhood tumor with gene amplification = Neuroblastoma
- A 3-year-old male child presented with a large intra-abdominal tumor. FNA revealed small blue cell tumor of childhood. Urinary catecholamine level was high. The most likely tumor is = Neuroblastoma
- A characteristic feature of neuroblastoma is = Increased secretion of catecholamines in urine
- Familial Adenomatous Polyposis (FAP) = APC gene defect
- Having its own particular type of formation spherical mass of hard tissue fused to the root of a tooth = Cementoma

241. WHICH OF THE FOLLOWING IS SIMILAR TO KAPOSI SARCOMA HISTOLOGICALLY=BACILLARY ANGIOMATOSIS

REMEMBER ABOUT THESE MALIGNANT VASCULAR TUMORS

Angiosarcoma	• Malignant endothelial tumor • It is associated with toxic exposures to arsenic or the radioactive diagnostic agent thorium dioxide (thorotrast). • Polyvinyl chloride is specifically associated with angiosarcoma of the liver. • It may arise in the skin of the breast following radiation therapy for breast cancer.
Kaposi sarcoma	• Is a malignant vascular tumor • Associated human herpes virus 8 (HHV-8), also called Kaposi sarcoma herpes virus (KSHV). • Epidemic KS occurs as a component of acquired immunodeficiency syndrome (AIDS)

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Exposure to vinyl chloride is associated with which of the following= Hepatic angiosarcoma
- Most common skin tumor associated with HIV is = Kaposi sarcoma

- A 38-year-old man has had increasing dyspnea with peripheral edema, worsening for the past two years. On physical examination he has diffuse crackles auscultated in both lungs. A chest radiograph shows that the heart nearly fills the chest. A chest CT scan demonstrates a 10 cm mass involving the right ventricle that appears to have areas of hemorrhage and necrosis within it. Which of the following neoplasms is this man most likely to have= Angiosarcoma
- Diagnosis for a homosexual male with elevated brown skin lesions and HIV positive partner? = Kaposi sarcoma
- Which of the following is similar to Kaposi sarcoma histologically = Bacillary angiomatosis

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242. A NEWBORN WAS NOTICED TO HAVE A BLUISH SWELLING ON HIS FACE. THE POSSIBLE DIAGNOSIS IS = HEMANGIOMA

NOTE ABOUT THESE BENIGN VASCULAR TUMORS

- Hemangioma (Angioma)
    - Malformation of a larger vessel.
    - It is the most common tumor of infancy
    - Responsible for port-wine stain birthmarks
- Hereditary Hemorrhagic Telangiectasia (Osler-Weber-Rendu):
    - Is an autosomal dominant condition.
    - Characterized by localized dilation and convolution of venules and capillaries of the skin and mucous membranes.
    - It is often complicated by epistaxis or gastrointestinal bleeding.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- A 10-year-old girl has a nodule on the skin of her upper chest for many years and it has not changed in size. On examination, it is a 0.3 cm dark red, non-tender, raised nodule with a smooth surface. The most likely diagnosis is = Hemangioma
- What is the most likely diagnosis for a swelling on the forehead having blood vessels and lymph in it? = Hemangioma
- With regard to "Strawberry-type" hemangioma, one of the following statements is correct = Mostly regression occurs before 5 years of age

CHAPTER # 9

ENDOCRINOLOGY

243. LIPOGENESIS, GLYCOLYSIS IS A FUNCTION OF WHICH HORMONE = INSULIN

ALL ABOUT HORMONES

Growth hormone:	↓ glucose uptake (diabetogenic), ↑ lipolysis, ↑ protein synthesis in muscle –inc in lean body mass
Somatostatin	inhibits the release of GH and other hormones, acting as a regulatory check.
ADH	↑ water reabsorption by acting on principal cells in kidney
Aldosterone:	↑Na reabsorption (principal cells), ↑K (principal cells) and ↑H (intercalated cells) secretion.
Thyroid hormone	↑gluconeogenesis, ↑ glycogenolysis, ↑lipolysis. The overall effect is catabolic—to meet the increase body requirement. bone maturation (thyroxin changes chondrocyte into osteocyte) maturation of CNS in perinatal period many actions as sympathetic nervous system ↑BMR, ↑ Heart rate- which may cause high output failure Causes uncoupling of oxidative phosphorylation with heat production
Glucocorticoids: (overall effect gluconeogenesis→ catabolic)	↑ lipolysis, **decrease glucose uptake** Cortisol→extrahepatic protein catabolism and hepatic protein anabolism **ACTH= hormone of stress**

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

GROWTH HORMONE

- Protein anabolism and fat catabolism are done by = Growth Hormone
- Growth hormone uses which as the main source for energy production? = Fat
- A physiological effect of growth hormone is = Increased amino acid transport into cells
- Growth hormone regulation by = Thyroxine
- Growth hormone needs which of the following to increase maximum effect? = Insulin-like growth factor
- Which hormone is anabolic on protein and catabolic on fats? = Growth Hormone
- Growth hormone secretion increases during = Hypoglycemia
  - It comes with different options so remember the sequence Hypoglycemia > Strenuous exercise > NREM sleep > REM sleep.
  - Growth hormone secretion increases during = Fasting
  - Growth hormone secretion increases during = Exercise
- Which hormone is increased during sleep time as compared to wakefulness? = Growth Hormone
  - Note--- If Growth Hormone (Somatotropin) is not an option, prefer cortisol.
- Growth hormone secretion increases during increased bone growth. Irregular thickening is due to stimulation of = Growth Hormone
- The levels of which hormone remain normal during pregnancy? = Growth Hormone

- Growth hormone does not increase during pregnancy. Which hormone acts as a growth hormone instead? = Human chorionic somatomammotropin
- The most sensitive test for growth hormone deficiency is = Insulin tolerance test
- Which hormone is immuno-stimulatory? = Growth Hormone (before puberty)
- A hormone which has an immunostimulatory effect is = Growth Hormone (before puberty)

SOMATOSTATIN

- Which of the following hormone acts on the anterior pituitary and leads to decreased release of Growth Hormone? = Somatostatin
  - It is also asked as
    - Somatostatin inhibits anterior pituitary which hormone? = Growth Hormone
    - The hormone acting on the anterior lobe of the pituitary to inhibit secretion of growth hormone most likely is = Somatostatin
- Somatostatin acts on beta cells by = Paracrine action
- Pain in abdomen, pancreatic fistula is present. In the hospital, somatostatin is given to the patient. The role of somatostatin is = Decrease secretions
- Which of the following is a potent inhibitor of insulin release? = Somatostatin

THYROID

- Hormone used for adjuvant therapy for depression= Thyroxine
- A specific metabolic effect of thyroid hormone at physiological level is= Increased protein synthesis
- For fetal brain maturation = Thyroid Hormone
- The basic metabolic function of thyroid hormone in a physiological state = Increase protein synthesis
- Receptors for thyroid hormone are located = Inside the nucleus.
- During fetal life, the hormone having a marked effect on brain development is: = Thyroid hormone
- Uncoupling of oxidative phosphorylation with increased heat production in the body results from the excess of: = Thyroid hormones
- Thyroid hormones increase the plasma level of: = Free fatty acids
- Which of the following has a classical steroid hormone mechanism of action: = Thyroid hormone

MELATONIN

- Anti-gonadotropin hormone released in dark is=Melatonin
- Which hormone is released in the dark and has anti-gonadotrophic activity=Melatonin
- One of the following is NOT a gastrointestinal hormone: = Melatonin
- Melatonin is a derivative of = Serotonin

OTHERS

- Triglyceride in the plasma are hydrolyzed by= Lipoprotein Lipase
- Which of following is thermogenic hormone= Progesterone
- Hormone causing glycogenolysis in liver= Principle cell of thyroid
- Growth hormone level increase, which of the following will decrease= Amino acid
- Bone growth caused by= Growth hormone
- Hormone causing hepatic protein anabolism and extrahepatic protein catabolism= Cortisol
- Inflammatory response decrease by which= Glucocorticoid
- A patient on Glucocorticoid's therapy, the blood picture will likely be of? = Lymphocytopenia
  - It is also asked as
    - A patient receiving glucocorticoids shows in his blood picture a decreased number of: = Lymphocytes
- Glucocorticoids decrease: = Glucose utilization in cells
- Increase in lymphocytes production and turnover is regulated by=Principal cells of thyroid

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25. WHICH HORMONE CAUSES PROTEIN, FAT & CARBOHYDRATE STORAGE= INSULIN

NOTE THIS,

Pancreas	❖ α cells → Glucagon (peripheral) ❖ β cells→ Insulin (central) ❖ δ cells→Somatostatin (interspersed)
Insulin	❖ Hormone that lowers blood glucose levels ❖ Carbohydrate, protein, fat synthèses hormone. ❖ The brain prefers glucose but may use ketone bodies during starvation. ❖ RBCs utilize glucose, as they lack mitochondria for aerobic metabolism.
Glucagon	❖ Hormone that raises blood glucose levels ❖ Promotes glycogenolysis, gluconeogenesis, lipolysis, ketogenesis. ❖ Elevates blood sugar levels to maintain homeostasis when bloodstream glucose levels fall too low (ie, fasting state). ❖ Secreted in response to hypoglycemia. ❖ Inhibited by insulin, hyperglycemia & somatostatin.
Starvation and Fed State	❖ Fed State (Post-meal): Glycolysis, aerobic respiration; insulin stores lipids, proteins, glycogen. ❖ Fasting (Between meals): Hepatic glycogenolysis (major), gluconeogenesis, FFA release; glucagon and epinephrine mobilize reserves. ❖ Starvation (Days 1–3): ▪ Blood glucose via glycogenolysis, FFA release, gluconeogenesis (lactate, alanine, glycerol). ▪ Glycogen depleted by Day 1; RBCs can't use ketones. ❖ Starvation (> Day 3): Ketones fuel the brain; depletes with adipose stores.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

GLUCAGON AND ITS ACTIONS

- ❖ Man develops hypoglycemia. Which hormone will correct it? = Glucagon
- ❖ The most important action of glucagon is to = Stimulate gluconeogenesis in the liver
  - o It is also asked as
    - ▪ Gluconeogenesis is an important feature of carbohydrate metabolism, the hormone mainly responsible is = Glucagon
    - ▪ The hormone which produces gluconeogenesis is = Glucagon
- ❖ Hormone related to glycogenolysis, gluconeogenesis, and ketogenesis is = Glucagon
  - o It is also asked as
    - ▪ Hormone which causes gluconeogenesis and glycogenolysis is released from = Alpha cells of the islet pancreas
    - ▪ Which of the following hyperglycemic factors is released by the pancreas? = Glucagon
    - ▪ A hyperglycemic factor produced by the pancreas is = Glucagon
- ❖ Hypoglycemia increases = Glucagon (Glucagon > Secretin)
  - o It is also asked as
    - ▪ In hypoglycemia, the hormone that increases to correct it is = Glucagon
    - ▪ The effects of glucagon on the heart closely resemble those of = Catecholamine
- ❖ Glucagon secretion is increased by = Exercise
  - o It is also asked as
    - ▪ Which hormone is increased during exercise? = Glucagon
- ❖ Cardiac contractility will be affected by which hormone the most? = Glucagon
  - o It is also asked as
    - ▪ Hormone that increases myo-contractility = Glucagon
- ❖ Glucagon decreases? = Fatty acid

INSULIN AND ITS EFFECTS

- Which hormone causes protein, fat, and carbohydrate storage? = Insulin
    - It also comes as
        - The storage cell for carbohydrates, protein, and lipid is regulated by = Insulin
        - The hormone that primarily causes the storage of carbohydrates, protein, and lipids = Insulin
        - The hormone promoting protein synthesis, lipogenesis, glycogenesis, and glycolysis is = Insulin
- Insulin decreases = Formation of ketone bodies in the liver
    - It also comes as
        - Insulin stimulates all except = Ketogenesis
        - The effect of decreased insulin on lipid metabolism? = Increased ketone bodies formation
        - In a patient with insulin deficiency, there is an increased = Ketogenesis in the liver
- Effect of insulin on adipose tissue = Increase Lipoprotein lipase
    - It also comes as
        - In adipose tissue, insulin is believed to activate = Lipoprotein lipase
- Which hormone inhibits hormone-sensitive lipase? = Insulin
- Effect of insulin is due to suppression of = Gluconeogenesis in the liver
- Insulin secretion is inhibited by? = Beta adrenergic blockers
- The most potent inhibitor of insulin is = Somatostatin
    - It also comes as
        - Somatostatin decreases insulin in a = Paracrine fashion
        - A potent stimulator of insulin secretion from pancreatic islets is = Gastric inhibitory peptide
- Insulin secretion is stimulated by = Glucagon
- Diagnosis in a patient with CNS symptoms, high insulin levels, increased C-peptide level, and hypoglycemia = Insulinoma
- A 26-year-old female presented with a history of fainting attacks off and on for the last 6 years. The most appropriate investigation would be = Glucose and insulin test with GTT
- A 50-year-old diabetic patient in hyperglycemic coma. The insulin of choice is = Regular insulin
- Duration of action of protamine zinc insulin is = 24 hours
- Na/K ATPase activity is stimulated by? = Insulin
    - It also comes as
        - Na/K ATPase activity is increased by = Insulin
- The delayed effects of insulin include = Transcription of mRNA for lipogenic enzymes
    - It also comes as
        - The delayed action of insulin is = Stimulate mRNA for lipogenesis
- A runner wins a marathon race. After finishing, hormone balance in the body will be = Decrease insulin and increase glucagon

Gluconeogenesis

- The most active gluconeogenesis results from the metabolism of = Proteins
- Gluconeogenesis mainly occurs in = Liver
- The most important hormone involved in gluconeogenesis is = Cortisol
- The main function of Cortisol is = Gluconeogenesis
- During long-term fasting, the major control of the rate of gluconeogenesis is by = Availability of alanine in blood

GLYCOGENOLYSIS

- Energy is derived between meals mainly by = Glycogenolysis
    - It is also asked as
        - Glucose is released from the liver between meals through which process? = Glycogenolysis
        - Glucose level between meals is maintained by = Hepatic glycogenolysis
- What is the effect of Epinephrine on carbohydrate metabolism? = Increase glycogenolysis
- The effect common to both Glucagon and Epinephrine is = Activate phosphorylase kinase

FFECTS OF GLUCOCORTICOIDS AND OTHERS

- Administration of glucocorticoids causes a decrease in = Peripheral glucose uptake into cells
- The actions following the use of glucocorticoids include a decrease in = Peripheral glucose utilization
- Compared with the resting state during prolonged exercise, the calorie needs of skeletal muscle are met by = Release of free fatty acids from adipose tissue

EMEMBER THESE MCQ'S ALMOST SAME BUT WITH DIFFERENT OPTIONS AND ANSWERS.

- The basic metabolic function of insulin at cellular level is= Entry of glucose in cells
- Which of the following is the immediate effect of Insulin= Potassium entry into the cell
- The basic metabolic function of insulin on carbohydrate is= Glycolysis

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INSULIN INDEPENDENT UPTAKE OF GLUCOSE OCCURS IN= EXERCISING SKELETAL MUSCLE

- Remember the mnemonic: **BRICK LIPS** (insulin-independent glucose uptake): **B**rain, **R**BCs, **I**ntestine, **C**ornea, **K**idney, **L**iver, **I**slet (β) cells, **P**lacenta, **S**permatocytes.
- Remember: Insulin independent glucose uptake occurs in → Excursing skeletal muscle > Brain.

NOW LET'S PRACTICE SOME PAST PAPER MCQS

- The type of receptor for insulin dependent uptake in skeletal muscle is= GLUT 4
- Insulin needed for glucose transport in= skeletal muscle
- Insulin increases the entry of glucose into=skeletal muscle
- Insulin independent glucose uptake occurs in = Exercising skeletal muscle

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HORMONE THAT ALWAYS ACT VIA CAMP MECHANISM=TSH

MECHANISM ABOUT HORMONE ACTION

cAMP mechanism **(FLAT ChAMP)**	IP_3 (inositol tri-phosphate) mechanism **(GOAT HAG)**	Steroid hormone mechanism **(PET CAT on TV)**	Tyrosine kinase activation **(Includes Growth Products)**	cGMP **(BAD GraMPa)**
FSH	GnRH	Progesterone	Insulin	BNP
LH	Oxytocin	Estrogen	IGF-1	ANP
ACTH	ADH	Testosterone	Growth hormone	EDRF (NO)
TSH	TRH	Cortisol	Prolactin	
CRH	Histamine (V_1 receptor)	Aldosterone		
hCG	Angiotensin-II	Thyroid hormones		
ADH	Gastrin	Vitamin D		
PTH				

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Which of the following hormones act through cAMP? = FSH
- The hormone that acts via cAMP is = TSH
- Which hormone always acts through cAMP as the second messenger system? = TSH
- Which hormone acts via cAMP? = ADH
- cAMP second messenger system acts through = Receptors
- Which of the following hormones act through cGMP? = ANP
- The mechanism commonly associated with lipophilic drug receptors = Increased cGMP levels
- Which of the following uses inositol 1,4,5-triphosphate (IP3) as a second messenger? = GnRH
- Which of the following leads to vascular smooth muscle contraction and uses inositol 1,4,5-triphosphate (IP3) as a second messenger? = ADH
- Which of the following uses Phospholipase-C as a secondary messenger? = Oxytocin

- Steroid hormones act on the target cells by = Activation of genes
- G protein-mediated phospholipase C results in intracellular increase of = Calcium

246. DESTRUCTION OF ANT. PITUITARY GLAND CAUSES DEC. FUNCTIONING OF = GLOM. FASCICULATA

REMEMBER

Parts	Hormone Class	Hormone Produced
Zona Glomerulosa	Mineralocorticoids	Aldosterone
Zona Fasciculata	Glucocorticoids	Cortisol
Zona Reticularis	Androgens	DHEA (dehydroepiandrosterone) and Androstenedione.

GFR corresponds with Salt (mineralocorticoids), Sugar (glucocorticoids), and Sex (androgens).

"The deeper you go, the sweeter it gets."

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Zona glomerulosa secrete= aldosterone
- Zona glomerulosa of adrenal gland controls secretion of which of the following=Aldosterone
- Regarding Zona Fasciculata of adrenal= Stimulated by ACTH
- Physiological effect of cortisol occurs on which hormones=Glucagon and epinephrine
- Principle steroid secreted by fetal adrenal Cortex= Dihydro Epiandristenedione

247. LUTEINIZING HORMONE IN MALES' ACTS ON = LEYDING CELLS

NOTE THE ALPHABET.

- Luteinizing hormone acts on = Leydig cells (also remember it produces testosterone)
- FSH acts on = Sertoli cells to maintain Spermatogenesis
- The Sertoli cells also secrete inhibin, which is involved in negative feedback of FSH secretion.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

SERTOLI CELLS AND THEIR FUNCTIONS

- Follicle-stimulating hormone acts on = Sertoli cells
- Inhibin is secreted by = Sertoli cells
    - It is also asked as
        - Negative feedback control of seminiferous tubules is controlled by one of the following secretions from Sertoli cells = Inhibin
        - FSH is inhibited in males by = Inhibin
- The most likely function of Sertoli cells is = Maintenance of the blood-testis barrier
    - It is also asked as
        - Sertoli cells act through = Acts as blood-testes barrier
- Anti-Mullerian hormone is produced by = Sertoli cells
    - It is also asked as
        - Sertoli cells produce = MIF (Mullerian inhibitory factor)
- Function of Sertoli cells = Aid in spermiogenesis
- Tall man with normal seminal fluid secretion but azoospermia. The defect is in = Sertoli cells
    - It also comes as
        - A tall man with normal external genitalia married but had no kids. He had a normal ejaculation period, but semen analysis showed azoospermia. Most likely cause may be in = Sertoli cells
        - A young male with normal external genitals having azoospermia and infertility. The defect is in = Sertoli cells

LEYDIG CELLS AND TESTOSTERONE

- Testosterone is secreted by = Leydig cells
- The cells of the testis which are directly affected or acted upon by LH are the = Leydig cells
- Leydig cell tumor contains = Reinke's crystals
- Cause of increased height and pubic hair in a 7-year-old boy with normal GnRH? = Leydig cell tumor
- Testosterone is the most potent androgen secreted mainly by the interstitial cells of Leydig; it = Increases protein synthesis in bones and muscles
- Hormone responsible for the development of internal genitalia in males is = Testosterone
- Male internal genital structure typically develops from = Testosterone
- Which hormone is converted into its active form at target tissue with the help of 5 alpha reductase? = Testosterone
    - Note this MCQ: Inhibition of which enzyme in the steroid hormone synthetic pathway reduces the size of the prostate? = 5 alpha reductase
- Testosterone is converted to estradiol by which hormone? = FSH
- Lowest testosterone levels are present in = Preschool

GONADOTROPINS (FSH, LH, AND GNRH)

- Which hormone stimulates the release of FSH and LH? = GnRH
- Function and development of seminiferous tubule require = FSH and androgen
- Spermatogenesis is stimulated by = FSH and testosterone
- During lactation, amenorrhea occurs due to = Inhibition of GnRH
- Married man with azoospermia. Investigation of choice is = Serum FSH + LH
- Function of LH before ovulation is = Convert most of the granulosa cells into lutein cells
- Conversion of testosterone to 17-beta estradiol in granulosa cells occurs by the influence of = FSH
- In males, antibodies against FSH will cause = Decreased sperm count
- Haploid number of chromosomes with haploid DNA are seen in = Spermatid

SPERMATOGENESIS

- Spermatogenesis is stimulated by = FSH & Testosterone
- Sperm life span in the female genital tract = 24-72 hours
- Spermatogenesis completes in how much period = 74 days
    - It usually comes with different options remember the range 64-74 days
        - Full regeneration of sperms takes how many days = 64 days
        - How long does spermatogenesis take to complete= 68 days
- The undifferentiated germ cells found in the basal compartment of seminiferous tubules are = Type A spermatogonia
- During spermiogenesis = Spermatids are transformed into spermatozoa
- Fertilin at head of sperm = Adherence of cap to the ovum
- The part of sperm containing proteolytic enzymes to digest the zona pellucida = Acrosome
- What happens to sperm when they reach the epididymis? = Directional movements
- Sperms become partially motile in = Epididymis
- Layers penetrated by sperm during fertilization = Corona Radiata, Zona Pellucida, Oocyte membrane
- Sperms are stored in = Seminal vesicles
- In a patient whose vasectomy has been done, the composition of ejaculated fluid will be = Prostatic and seminal fluid
- Azoospermia is the term used to describe = Absence of sperm cells in semen
- Infertility in males with Kartagener syndrome is due to = Azoospermia
- Infertility in Kartagener syndrome is due to = Azoospermia
- Semen analysis of a 30-year-old male revealed absence of spermatozoa. The man is most likely suffering from = Azoospermia
- The immunoglobulin subtype most useful in non-invasively diagnosing obstructive azoospermia is = IgG
- Antisperm antibodies may impede sperm function by all except = Removing sperm cap

- Semen analysis: 25% partially motile, 25% motile, and some were twitching spasmodically. = Sample taken directly from seminiferous tubules

TUMORS IN YOUNG GIRLS

- A 6-year-old girl has a history of 2 weeks of abdominal pain. She is taller than her peers. Physical exam shows breast development, abdominal distention, axillary and pubic hair development. Blood is present at the introitus, and pelvic exam is attempted but cannot be accomplished. Abdominal USG shows an ovarian mass. What is the likely cause? = Granulosa theca cell tumor
- 6-year-old girl breast development and vaginal spotting. O/E no hair development and ovarian mass. Diagnosis = Sertoli Leydig cell tumor

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248. 50 YEARS OLD FEMALE WITH NORMAL LIVING. WHAT WILL HAPPEN POST-MENOPAUSAL= INCREASE FSH & LH

NOTE

- LH: FSH ratio of 3:1= PCOD
- Female with hot flushes = Increase FSH and LH
- Menopause= Dec Estrogen and increase FSH and LH

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- 18-year-old girl, height 150 cm, weight 70 kg, hair distribution on body, FSH 122, LH 40, increased testosterone, increased estrogen. Diagnosis = PCOD
- A 21-year-old girl with abnormal hair growth, amenorrhea, and obesity is likely suffering from = Polycystic ovary syndrome (PCOS).
- In polycystic ovarian syndrome (PCOS), increased androgens are due to = LH and insulin
- Which of the following antiandrogens is used for the treatment of hirsutism? = Cyproterone acetate
- A 35-year-old female presented with an irregular cycle—2-3 cycles/year, weight gain, and hirsutism. She is at risk of developing = Endometrial adenocarcinoma
- Post-menopausal findings are = Decrease Estrogen, increased FSH and LH
    - It also comes as
        - A 50-year-old healthy postmenopausal lady will be having = Raised plasma FSH and LH levels
        - Menopause is characterized by = Low estrogens with high FSH & LH
        - Hormone status in a post-menopausal woman = FSH, LH increased
        - A 48-year-old lady presented with amenorrhea for 8 months. Reason for menopause = Low estrogen with high FSH and LH
        - A 50-year-old lady complains of hot flushes and frequent body aches. Laboratory investigation is likely to show raised levels of = FSH and LH
- A female has menopause at the age of 46. The significant possibility of this woman's daughter having menopause at the same age is = 5-6%
- Low level of cholesterol before menopause is due to = Estrogen
- A 45-year post-menopausal female presented with a fracture, and on X-ray osteoporosis is seen. This is likely due to low = Estrogen
- Post-menopausal woman with a 5 cm adnexal mass and endometrium 2.5 cm thick. Most likely = Granulosa cell tumor of ovary

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249. DURING LACTATION, OVULATION IS INHIBITED BECAUSE OF INHIBITION OF GNRH BY= PROLACTIN

NOTE THE FUNCTION OF OXYTOCIN AND PROLACTIN

- **Prolactin**—induces and maintains lactation and ↓ reproductive function.
- **Oxytocin**—assists in milk letdown; also promotes uterine contractions.

Ovulation is suppressed as long as lactation continues because prolactin has the following effects:

- Semen analysis: 25% partially motile, 25% motile, and some were twitching spasmodically. = Sample taken directly from seminiferous tubules

TUMORS IN YOUNG GIRLS

- A 6-year-old girl has a history of 2 weeks of abdominal pain. She is taller than her peers. Physical exam shows breast development, abdominal distention, axillary and pubic hair development. Blood is present at the introitus, and pelvic exam is attempted but cannot be accomplished. Abdominal USG shows an ovarian mass. What is the likely cause? = Granulosa theca cell tumor
- 6-year-old girl breast development and vaginal spotting. O/E no hair development and ovarian mass. Diagnosis = Sertoli Leydig cell tumor

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248. 50 YEARS OLD FEMALE WITH NORMAL LIVING. WHAT WILL HAPPEN POST-MENOPAUSAL= INCREASE FSH & LH

NOTE

- LH: FSH ratio of 3:1= PCOD
- Female with hot flushes = Increase FSH and LH
- Menopause= Dec Estrogen and increase FSH and LH

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- 18-year-old girl, height 150 cm, weight 70 kg, hair distribution on body, FSH 122, LH 40, increased testosterone, increased estrogen. Diagnosis = PCOD
- A 21-year-old girl with abnormal hair growth, amenorrhea, and obesity is likely suffering from = Polycystic ovary syndrome (PCOS).
- In polycystic ovarian syndrome (PCOS), increased androgens are due to = LH and insulin
- Which of the following antiandrogens is used for the treatment of hirsutism? = Cyproterone acetate
- A 35-year-old female presented with an irregular cycle—2-3 cycles/year, weight gain, and hirsutism. She is at risk of developing = Endometrial adenocarcinoma
- Post-menopausal findings are = Decrease Estrogen, increased FSH and LH
    - It also comes as
        - A 50-year-old healthy postmenopausal lady will be having = Raised plasma FSH and LH levels
        - Menopause is characterized by = Low estrogens with high FSH & LH
        - Hormone status in a post-menopausal woman = FSH, LH increased
        - A 48-year-old lady presented with amenorrhea for 8 months. Reason for menopause = Low estrogen with high FSH and LH
        - A 50-year-old lady complains of hot flushes and frequent body aches. Laboratory investigation is likely to show raised levels of = FSH and LH
- A female has menopause at the age of 46. The significant possibility of this woman's daughter having menopause at the same age is = 5-6%
- Low level of cholesterol before menopause Is due to = Estrogen
- A 45-year post-menopausal female presented with a fracture, and on X-ray osteoporosis is seen. This is likely due to low = Estrogen
- Post-menopausal woman with a 5 cm adnexal mass and endometrium 2.5 cm thick. Most likely = Granulosa cell tumor of ovary

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249. DURING LACTATION, OVULATION IS INHIBITED BECAUSE OF INHIBITION OF GNRH BY= PROLACTIN

NOTE THE FUNCTION OF OXYTOCIN AND PROLACTIN

- Prolactin—induces and maintains lactation and ↓ reproductive function.
- Oxytocin—assists in milk letdown; also promotes uterine contractions.

Ovulation is suppressed as long as lactation continues because prolactin has the following effects:

- Inhibits hypothalamic GnRH secretion.
- Inhibits the action of GnRH on the anterior pituitary and consequently inhibits LH and FSH secretion.
- Antagonizes the actions of LH and FSH on the ovaries

Dopamine → Inhibits prolactin

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

PROLACTIN REGULATION & MILK SECRETION

- L-dopa inhibits which hormone in lactating mothers? = Prolactin
- Bromocriptine causes decreased prolactin levels by acting on = Dopamine receptors
  - It is also asked as
    - Bromocriptine's therapeutic action in prolactinoma = Inhibits prolactin release from the anterior pituitary
    - Bromocriptine causes = Decrease prolactin release from pituitary
- Prolactin secretion is regulated by the neurotransmitter = Dopamine
  - It also comes as
    - The pituitary hormone under predominant inhibitory control by the hypothalamus is = Prolactin
    - Dopamine has inhibitory effects on = Prolactin
    - Prolactinoma in female is due to=Decrease dopamine from hypothalamus
- The secretion of milk in the mammary gland is due to = Prolactin
  - It also comes as
    - A 9-month pregnant woman presents with complaints of lactation (milky discharge). This is likely due to = Prolactin
    - Potent stimulus for prolactin release is = Suckling reflex of baby
    - A woman 2 days postpartum wants to breastfeed; the hormonal change in her body is = Hypothalamic prolactin increase
    - Which hormones are responsible for milk production? = Prolactin, oxytocin, cortisol
    - Milk secretion from the breast = Prolactin
- A 30-year-old woman, who has two healthy children, notes that she has had no menstrual periods for the past 6 months, but she is not pregnant. Which of the following laboratory test findings is most likely to be present in this woman? = Hyperprolactinemia
  - It also comes as
    - Para 2 amenorrhea for 6 months but not pregnant, notices milk coming out of her nipples, and has bitemporal hemianopia. What lab finding would most likely be present in this patient? = Hyperprolactinemia
    - Amenorrhea in a non-pregnant female who notices milk coming out of her nipples, and has bitemporal hemianopia. What finding would most likely be present in this patient? = Hyperprolactinemia
- Prolactinoma in females is due to = Decreased dopamine from the hypothalamus
- A woman with a 5-year-old baby now complains of infertility, irregular menstruation with decreased flow, and intermittent breast secretion. Hormone responsible is = Prolactin
  - Note: For **lactation** , mnemonic: **Pro** lactin =**ProLACTATION**
- In more than 50% of lactating women, ovulation is inhibited. This is due to inhibition of GnRH secretion from the hypothalamus by = Prolactin
  - It also comes as
    - Lactation causes suppression of GnRH by = Prolactin
    - During lactation, ovulation is inhibited because of inhibition of GnRH by = Prolactin
    - Additional Note: Lactation in pregnancy is inhibited by = Estrogen
- 24 hours after termination of a 20-week pregnancy, a 25-year female presents to you with complaints of discharge from nipples. The most likely cause is = Pregnancy-induced hyperprolactinemia
- Nipple discharge after a pregnancy termination at 20 weeks is due to = Hyperprolactinemia of pregnancy

- Likely cause of erection problem and enlarged breast in a 20-year-old male = Prolactin
  - Note---Erectile dysfunction due to suppression of gonadotropin-releasing hormone (GnRH), which decreases testosterone levels

Oxytocin and Its Functions

- Regarding oxytocin, which is correct? = Is released during labor when there is stretch on the cervix and causes dilation
- Action of oxytocin = Increased stimulation of the uterus when given with progesterone
  - It is also asked as
    - Oxytocin = Increase uterine contraction
    - During parturition, enhanced myometrial activity is due to increased levels of = Oxytocin
- The uterus is more sensitive to which hormone during the last trimester? = Oxytocin
  - It also comes as
    - During the last trimester, the endometrium is sensitive to = Oxytocin
    - In late pregnancy, the uterus becomes most sensitive to = Oxytocin
- Pregnant lady with a dead fetus, oxytocin given but she is not responding to it. This is likely due to = Less receptors in myometrium
  - It also comes as
    - A woman during delivery is not responding to Estrogen. This is due to? = Decrease in estrogen receptors on the myometrium
- During pregnancy, the uterine smooth muscle is quiescent due to = Decrease in oxytocin
- Suitable drug for a pregnant woman with irregular uterine contractions is = Oxytocin
- Use of oxytocin in obstetrics is = To augment uterine contraction
- Pt came after delivery at home with bleeding and decreased uterine tone. First drug to be given is = Oxytocin
- A 38-year-old grand multipara suffered uterine atony post-delivery. Your first step in management would be the administration of = Oxytocin
- Hormones responsible for lactogenesis = Oxytocin, prolactin, and cortisol
- Hormones required to maintain lactation = Oxytocin, prolactin, cortisol

Others

- About breast= divided into 15-20 lactiferous duct
- Amenorrhea during lactation. Cause is=Inhibition of GnRH
- To confirm a pregnancy which of the following is checked in urine= Beta HCG.
- B-HCG (human chorionic gonadotrophin) is detected in urine after = 10 days.
  - HCG in **urine= 10 days**
  - HCG in **blood= 8 days**
- Anterior pituitary lobe surgery done, what will be first lost= Menstruation

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230. Before Ovulation maturation of follicles occur by action of= FSH

Remember:

- Maturation of follicles= Hormone responsible is FSH mainly and LH partly.
- Ovulation= Hormone responsible: ↑ LH

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- A lady who has a normal cycle of 28 days has increased levels of 17 beta estradiol without any increase in progesterone for 3 days. What can possibly occur next? = Ovulation.
- Following ovulation, the ovum is viable for up to = 24 hours.
- An example of direct positive feedback is = Estradiol increasing GnRH release near the time of ovulation.
- Two days before ovulation, the LH is increased by = 6-10 fold.
- Mechanism of action of oral contraceptive pills (OCP) is = Inhibiting ovulation.

- ❖ Clomiphene citrate mode of action = Ovulation induction.
- ❖ The most common cause of subfertility is** = Failure of ovulation.
- ❖ Female patient with primary infertility. Most reliable indicator of ovulation during ovulation phase = Fern test becomes negative.
    - o It also comes as
        - ▪ What is definitive evidence for ovulation = Ferning of cervical mucus.
- ❖ A female married, age 18 yrs presented with amenorrhea of 8 weeks and B-hCG is negative. Physical findings show no abnormality. Cause is** = Anovulation.
    - o It also comes as
        - ▪ 16 years old married female having history of 8 weeks amenorrhea, her pregnancy test is negative and physical findings are near to normal. What is your diagnosis = Anovulation.
- ❖ Secondary amenorrhea history, best investigation = FSH, LH, Prolactin.

251. ALVEOLI AND LOBULES DEVELOPMENT IN BREAST ARE MAINLY BY= PROGESTERONE

ESTROGEN VS PROGESTERONE

Estrogen	Progesterone
❖ Has both negative and positive feedback effects on FSH and LH secretion	❖ Has negative feedback effects on FSH and LH
❖ Causes the development of the breasts, fat deposition and secondary sex characteristics	❖ Participates in development of the breasts, maintains endometrium thickness
❖ Maintains pregnancy	❖ Maintains pregnancy
❖ Lowers the uterine threshold to contractile stimuli during pregnancy	❖ Raises the uterine threshold to contractile stimuli during pregnancy.
❖ Stimulates prolactin secretion (but then blocks its action on the breast).	

ESTROGEN VARIATIONS OVER THE LIFE SPAN

Estrogen in Reproductive years (**when a woman is like a doll**) --- estra**DIOL.**

- ❖ Estrogen in pregnancy----- est**RI**ol - (**TRI** - mom, dad, child) (used for screening congenital abnormality).
- ❖ Estrogen in menopause---------------------ESTRONE --- (**ONE** - woman becomes single again)

POTENCY:

- ❖ Estradiol > Estrone > Estriol

NOW LET'S SOLVE SOME PAST PAPER MCQ'S

ESTROGEN ACTIVITY AND FUNCTION

- ❖ The most important role of estrogen is? = Development of secondary sexual characters
- ❖ The most likely feature about estrogens is: = Are secreted by ovaries
- ❖ Lactation in pregnancy is inhibited by? = Estrogen
- ❖ Fat deposition of the breast is the function of which hormone? = Estrogen
- ❖ The most potent form of estrogen? = Estradiol
- ❖ High karyopyknotic index in healthy young women indicates? = High estrogen activity
- ❖ Proliferation of lactiferous ducts and fat deposition in breast due to? = Estrogen
- ❖ A 68-year-old female with a sedentary lifestyle experiences fracture of the neck of femur due to? = Lack of Estrogen
    - o It also comes as
        - ▪ A 30-year-old female with a history of no menstruation for 5 years had a fracture during a sprint. The cause of the fracture is? = Low estrogen levels

        - Osteoblastic activity is decreased by? = Estrogen
- The most likely cause of atrophy of the breast in an adult female is due to deficiency of? = Estrogen
- A mother worried about her young daughter who has a loss of pubic and axillary hair with secondary sexual characteristics. The most likely cause is a decrease in? = Estrogen
- A 42-year-old female has a history of abnormal vaginal bleeding. The endometrial biopsy reveals simple cystic hyperplasia. This change is most likely associated with? = High level of estrogenic stimulation
    - It also comes as
        - Simple cystic hyperplasia of the endometrium is associated with? = High level of estrogenic stimulation
- A female with fibroid has an increase in? = Estrogen
- Long-term complication of estrogen use? = Endometrial Cancer
- The following hormone does not stimulate spermatogenesis: = Estrogens (from the adrenal cortex)
- The mechanism of action of Tamoxifen is? = Estrogen receptor blocker
- The failure rate of contraceptive methods, from least to most, is in which order? = Tubal ligation, estrogen-containing pills, condom, lactation

PROGESTERONE AND ITS FUNCTIONS

- In the breast, the development of alveoli and lobule growth is done by which hormone? = Progesterone
    - It is also asked as
        - Most important function of progesterone? = Breast alveolar duct development
        - The proliferation of breast alveoli and lobules is mediated by which hormone? = Progesterone
- An injection to delay menstruation given at day 14 of the cycle contains? = Progesterone
- During pregnancy, softening of the uterus by which hormone? = Progesterone
- A pregnant female presented with PV bleeding at 6 weeks. Which hormone will be low in case of miscarriage? = Progesterone
- Hormonal analysis most helpful for diagnosing recurrent abortion? = Progesterone
- Progesterone is a precursor of: = Aldosterone, cortisol, and corticosterone
    - It also comes as
        - Which of the following are derivatives of Progesterone? = Aldosterone, androstenedione, cortisol
        - A female presented with weight gain, round moon face, abdominal obesity with striae. The hormone causing these symptoms is a derivative of? = Progesterone
        - Hormone needed for the production of the excess hormone in Cushing's syndrome? = Progesterone
- A female taking medicine since menarche for acne now develops small breasts, deepening of voice, and weight gain. The drug responsible for it is = Medroxyprogesterone acetate
- Progesterone-containing pills, what is the mode of contraception? = Inhibit release of egg

OTHERS

- A mother worried about her young daughter who has a loss of pubic and axillary hair with secondary sexual characteristics. What is the most likely cause? = DHEA Androsterone
- The most important function of progesterone is=maintains thickness of endometrium
    - It also comes as with no option of maintain thickness
        - Which of the following is most important function of progesterone=Breast alveoli development
        - Function of progesterone sequence= Maintenance of thickness of Endometrium >> Secretory phase>> development of alveoli and Lobule
- Secretory proliferation of endometrium is done by=Progesterone

2[illegible], ON HORMONAL REPLACEMENT THERAPY. WHICH HORMONES TO PREFER=ESTROGEN + PROGESTERONE

NOTE THE DIFFERENCE

- Increased risk of endometrial cancer---Reduced by the addition of a progestogen
- Increased risk of breast cancer-------- increased by the addition of a progestogen

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253. BREAST ATROPHY IN ADULT FEMALE IS DUE TO = ESTROGEN AND PROGESTERONE

PLEASE CLEAR YOUR CONCEPT

- Remember Breast atrophy whether it's in young female or adult female= is caused by both estrogen and progesterone deficiency
- If asked major/most common or either you have to choose one cause than click = estrogen
    - Reference = Big Snell, page 336, Ed: 9th

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254. A LADY HAS A 28-DAY CYCLE. SHE HAS INCREASED LEVELS OF 17-BETA ESTRADIOL WITHOUT ANY INCREASE IN PROGESTERONE FOR THE LAST THREE DAYS. WHAT IS NEAR TO OCCUR? = OVULATION

MENSTRUAL CYCLE

- Follicular Phase (Days 0–14):
    - Hormones: **FSH (main)**, LH (partly).
    - Primordial follicle → Graafian follicle (FSH & LH).
    - LH/FSH receptors upregulated → ↑ Estradiol → uterine proliferation.
    - Estradiol inhibits FSH/LH via negative feedback.
    - Progesterone: Low.
- Ovulation (Day 14):
    - Hormone: LH surge.
    - Occurs 14 days before menses, irrespective of cycle length.
    - Estradiol burst → LH/FSH surge → Ovulation.
    - Cervical mucus: ↑ quantity, ↓ viscosity.
    - Estrogen dips post-ovulation but rises in the luteal phase.
- Luteal Phase (Days 14–28):
    - Corpus luteum produces estrogen, progesterone.
    - Endometrium prepares for implantation.
    - Basal body temperature ↑** (progesterone effect).
    - If fertilization: hCG maintains corpus luteum → progesterone.
    - If no fertilization: Corpus luteum → corpus albicans → ↓ estrogen, progesterone.
- Menses (Days 0–4):
    - Endometrium sheds due to ↓ estradiol and progesterone.

NOW LET'S PRACTICE SOME PAST PAPER MCQS

HORMONAL CHANGES AND MENSTRUAL PHASES

- Which hormone increases in the mid-luteal phase? = Progesterone and estrogen
- The most important function of progesterone is? = Maintain endometrium thickness
- Secretory proliferation of endometrium is done by? = Progesterone
- Saw-toothed appearance of glands, vacuolization, and edematous stroma? = Secretory phase
- Tortuous, coiled glands in the endometrium are seen in? = Secretory phase
- A 23-year-old female with a menstrual cycle of average 28 days, on the 21st day of her last menstrual period, the most appropriate condition of her uterus is = Secretory phase.
    - It also comes as:
        - Patient presented on the 18th day of the menstrual cycle. Her normal cycle is such that she ovulates on day 14. Which phase will she be in = Secretory phase.
- A 42-year para +3 reported with heavy cyclic vaginal bleeding for the last 6 months. Her clinical examination was unremarkable. She had recent D&C and histopathology showed early secretory phase endometrium. What is the best standard first line of treatment? = Mefenamic acid

- A 52-year-old woman has her anterior pituitary removed, without adequate hormonal therapy. What will occur first? = Absence of menstruation
- The first sign indicating reproductive ability in a girl is? = 1st period of menstruation
- Substance injected to prevent menstruation during the normal menstrual cycle? = HCG
- During the normal menstrual cycle, endometrial shedding and bleeding is due to? = Regression of corpus luteum
- The age of an embryo can be computed from the 14th day after? = Onset of last menstruation
- First stage during the onset of puberty= Breast bud appears.
- During menstruation and parturition which layer is shed off = Functionalis (Functional layer of endometrium is shed, or endometrium if option available).
- The functional layer of the endometrium consists of? = Stratum compactum and stratum spongiosum

255. IF OVARIAN CYCLE DURATION IS 21-23 DAYS, WHEN WILL THE OVULATION TAKES PLACE= 7-9 DAYS

- Note that ovulation Occurs 14 days before menses, regardless of cycle length.
  - Thus, in a 28-day cycle, ovulation occurs on day 14;
  - In a 35-day cycle, ovulation occurs on day 21.
- The next phase after ovulation of the menstrual cycle is the luteal or secretory phase. This phase always occurs from day 14 to day 28 of the cycle

NOW LET'S PRACTICE SOME PAST PAPER MCQS

- Ovulation occurs on which day of the menstrual cycle = 14th day.
  - It also comes as
    - If the ovarian cycle duration is 32 days, when will ovulation take place? = 18 days.
    - A woman with a 24-day regular menstrual cycle. As per cycle, her ovulation will occur on? = 10th day from the beginning (1st day) of her last menstrual period.
    - A female had 23 days of menstrual cycle. Ovulation will occur at = 9th day.

256. DURING 2ND STAGE OF LABOR, WHICH IS IMPORTANT FACTOR=ABDOMINAL MUSCLE CONTRACTION

EMBRYOLOGICAL AND STRUCTURAL CHANGES IN PREGNANCY

- Tertiary villus contains? = Fetal vessels
- Obliteration of uterine cavity occurs due to fusion of? = Decidua parietalis and capsularis (Ref: KLM Embryology)
- In mid-trimester, RBCs are produced from? = Liver

PREGNANCY-RELATED MEDICAL CONDITIONS AND MANAGEMENT

- A pregnant lady develops pain after a few hours of delivery. ECG shows S1, Q3, T3. What is the most appropriate test for the diagnosis of this case? = Gallium scan
- A pregnant woman presented with hypertension. The drug of choice will be = Methyldopa
  - Remember:
    - Pregnancy-induced hypertension: Labetalol > Methyldopa
    - Pre-eclampsia hypertensive condition: IV Hydralazine > Labetalol
    - Eclampsia: $MgSO_4$
- A 30-year-old who is pregnant for the 3rd time dies in the 3rd trimester in a roadside accident. This type of death is defined as? = Fortuitous death
- A pregnant lady presents to you with hyperemesis gravidarum and alkalosis. Which electrolyte abnormality is she likely to have? = Hypokalemia
- Cervical ectropion occurs in? = Normal in pregnancy
- Difference between carbohydrate metabolism of pregnant and non-pregnant is? = Postprandial hyperglycemia

- A pregnant female suddenly faints and was taken to ER. The doctor advised positioning her in the left lateral and not the right lateral position to avoid compression with which abdominal structure? = IVC
- An epileptic lady who is currently on phenytoin has become pregnant. She is concerned about her medication in pregnancy. Which of the following is correct? = Replace with barbiturate (no option of lamotrigine in the paper, if available prefer it)
- There is variation in the incidence of pre-eclampsia. The most significant change in the fall of the disease is due to? = Unanimous definition of the disease
- A female in her 2nd trimester of pregnancy presents with BP 160/110. She should likely be started on? = Alpha Methyldopa

Hormonal Changes During Pregnancy

- Which of the following hormone levels remain normal during pregnancy? = Growth hormone
    - It also comes as
        - The blood levels of a pregnant lady in the second trimester will show normal levels of which hormone? = Growth hormone
- Growth hormone does not increase during pregnancy. Which hormone acts as a growth hormone instead? = Human chorionic somatomammotropin
- Early detection of pregnancy best diagnosed after 10 days of conception by? = Serum beta HCG
- The hormone which triggers the onset of parturition in the mother is? = Fetal cortisol
- A 43-year-old lady with 3 children and normal reproductive cycle has less chance of pregnancy as compared to a 33-year-old female. Reason is? = Inhibition of GnRH
- Pt came after delivery at home with bleeding and decreased uterine tone. First drug to be given is= Oxytocin

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257. SIADH FEATURE= HYPONATREMIA

REMEMBER THE DIFFERENCE BETWEEN THESE THREE

Disorder	Serum Na+	Serum Osmolality	Urine Osmolality
Dehydration	Inc	Inc	Inc
DI	Inc	Inc	Dec
SIADH	Dec	Dec	Inc

NOW LET'S SOLVE SOME PAST PAPER MCQ'S

Diabetes Insipidus

- In Diabetes Insipidus, there is change in? = Decrease urine osmolarity
    - It also comes as
        - Diabetes insipidus causes a fall in the? = Osmolality of the urine
        - Which of the following will be seen in Diabetes Insipidus? = Reduced urine osmolality
- The drug of choice for central diabetes insipidus is = Desmopressin
- Diabetes Insipidus causes a fall in? = Decrease urine osmolarity
- A 65-year-old male with stroke has decreased appetite, thirst, and tendency to vomit. The cause of his decreased thirst would be increased = ADH

Syndrome of Inappropriate Antidiuretic Hormone (SIADH)

- A 7-year-old child presents with drowsiness. His labs report urea 15 mg/dL, Na 110 mmol/L, K 3.4 mmol/L, HCO3 26, R.S 110 mg/dL, urine osmolality 610 mOsm/kg. The most likely cause is: = Syndrome of inappropriate secretion of ADH (SIADH)
    - It also comes as
        - 7-year-old presented with headache, sodium is 110, urine osmolality of 610. Diagnosis? = SIADH
- Negative free water loss occurs in: = SIADH
- Difference between normal people and SIADH is: = Plasma/blood osmolarity

- It is also asked as
  - Which factor would best distinguish an otherwise healthy person with severe water deprivation from a person with SIADH= Serum osmolarity
- A fall in plasma sodium concentration: = Can be caused by excessive (inappropriate) secretion of ADH
- A patient with a lung tumor has high circulating levels of antidiuretic hormone, a serum osmolarity of 260 mOsm/L, and a negative free water clearance. The most likely cause is: = Syndrome of inappropriate antidiuretic hormone (SIADH)
  - Note: normal serum osmol=280-290, for SIADH pOSM<280
- Scenario of decreased serum osmolarity and increased urine osmolarity? = SIADH
- What is the primary effect of increased ADH= Urine osmolarity is higher than plasma osmolarity
- In patients with Syndrome of Inappropriate Antidiuretic Hormone Secretion (SIADH) and elevated ADH levels, what is typically observed= Hyperosmolar urine

WATER DEPRIVATION AND RELATED CONDITIONS

- A woman has a plasma osmolarity of 300 mOsm/L and a urine osmolarity of 1200 mOsm/L. The most likely diagnosis is= Water deprivation
- Hyperosmolar overhydration? = Water deprivation
- Urine osmolarity 1200 mEq/L & plasma osmolarity 300 mEq/L. Diagnosis? = Water deprivation
- A person who is thirsty has a urine osmolarity of 950 mOsm/L and a serum osmolarity of 297 mOsm/L. The most likely cause is: = Water deprivation

HYPOTHALAMIC LESIONS AND ASSOCIATED SYMPTOMS

- A 40-year-old woman presents with increased frequency and volume of urine, increased body weight, increased thirst. Her relatives also complain of her uncontrolled behavior. There is no sensory loss and motor loss. Her investigations show fasting plasma glucose 105 mg/dl and low osmolarity of urine. The woman is most likely to have a lesion of: = Hypothalamus
- A boy after injury to the head presented with complaints of weight gain, increased appetite, and thirst. Lesion is in which area? = Hypothalamus
- A 35-year-old pregnant lady comes with complaints of increased water intake, urination, and increased thirst. Her neighbors have also mentioned that she has had some strange behavior changes. The lesion is present in which part of the brain? = Hypothalamus

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258. A 45-YEAR-OLD WOMAN PRESENTS WITH EXCESSIVE THIRST AND URINATION. LABORATORY TESTS REVEAL A URINE OSMOLALITY OF 100 MOSM/KG AND A SERUM SODIUM LEVEL OF 150 MEQ/L. AFTER ADMINISTRATION OF DESMOPRESSIN, HER URINE OSMOLALITY INCREASES TO 600 MOSM/KG. WHAT IS THE MOST LIKELY DIAGNOSIS= CENTRAL DIABETES INSIPIDUS

KNOW ABOUT THESE

	Primary Polydipsia	Central DI	Nephrogenic DI
Definition	Excessive water intake	ADH deficiency	Renal resistance to ADH
Causes	Psychiatric illnesses, hypothalamic lesions affecting thirst	Idiopathic, trauma, hypoxia, tumors, infiltrative diseases	ADH receptor mutation, drugs (lithium), hypercalcemia, hypokalemia
Serum osmolality	↓	↑	↑
ADH levels	Normal or ↓	↓	Normal or ↑
Water restriction test	Significant ↑ urine osmolality (> 700 mOsm/kg).	No or minimal ↑ urine osmolality	No or minimal ↑ urine osmolality

Desmopressin test	No administration required	Significant ↑ urine osmolality (> 50%)	Minimal change in urine osmolality
Treatment	Water restriction	Desmopressin (DDAVP)	Manage cause, low-solute diet, HCTZ, amiloride
Key tests	Water Restriction Test: Distinguishes primary polydipsia (↑ urine osmolality) from DI (no or minimal change). Desmopressin Test: Differentiates central DI (↑ urine osmolality) from nephrogenic DI (no response).		

NOW LET'S SOLVE SOME PAST PAPER MCQ'S

- A woman suffers a severe head injury in an accident. Shortly afterward, she becomes polydipsic and polyuric. Her urine osmolarity is 75 mOsm/L, and her serum osmolarity is 305 mOsm/L. Treatment with vasopressin causes an increase in her urine osmolarity to 450 mOsm/L. The most likely diagnosis is = Central diabetes insipidus
- A 38-year-old patient presented with increased thirst and increased frequency of micturition. The doctor gave him an intravenous injection of ADH, but his complaints did not improve or disappear. The most likely disorder in this patient was: = Nephrogenic diabetes insipidus
- A patient is passing 4 to 8 liters of urine. Urine osmolarity is 265. After water deprivation, it increased to 700. After DDAVP, it increased to 1000. Dx? = Psychogenic polydipsia

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259. CUSHING FEATURES WITH RAISE ACTH = CUSHING DISEASE

Primary Hyperaldosteronism (Conn syndrome)	Secondary Hyperaldosteronism	Primary Adrenal Insufficiency (Addison's Disease)	Cushing Syndrome
• Primary hyper production of adrenal mineralocorticoids • Hypokalemia • Hypertension • ↑ aldosterone, ↓ renin.	• Secondary to renal ischemia, renal tumors, and edema (e.g., cirrhosis, nephrotic syndrome, cardiac failure). • ↑ aldosterone, ↑ renin.	• Hypotension • Hyperkalemia • Increased pigmentation of skin;	• Hypokalemia • Non-specific→secondary diabetes, HTN, osteoporosis • More specific→ central obesity with extremity wasting, moon facies, buffalo hump • Most specific→spontaneous bruising, *skin striae*, proximal myopathy

- **KNOW THE DIFFERENCE**
  - ✓ Cushing features with Raise ACTH = Cushing disease
  - ✓ While in Cushing syndrome= ACTH is not increased

NOW LET'S SOLVE SOME PAST PAPER MCQ'S

CUSHING AND ACTH

- A woman has hirsutism, hyperglycemia, obesity, muscle wasting and increased circulating levels of adrenocorticotropic hormone. The most likely cause of her symptoms is? = Primary overproduction of ACTH

- It also comes as
    - A 30-year-old female presented to OPD with excess hair growth, hypertension, hyperglycemia, hyperpigmentation, increased depression, oedematous face, and increased fat deposition on the chest and trunk. These are likely caused due to excess of = ACTH
    - A woman has hirsutism, hyperglycemia, obesity, muscle wasting, and increased circulating levels of adrenocorticotropic hormone. The most likely cause of her symptoms is: = Primary overproduction of ACTH
    - A 23-year-old female patient presented with hyperpigmented skin along with extra deposited fat in the thoracic and abdominal region. Her face appeared edematous, and acne was found on her facial skin. She also had excessively grown facial hair and gave a history of hypertension. Hormonal imbalance was diagnosed after detailed investigations. The most likely cause in this case is excessive secretion of: = ACTH
    - A woman has hirsutism, hyperglycemia, obesity, muscle wasting, and increased circulating levels of adrenocorticotropic hormone (ACTH). The most likely cause of her symptoms is: = Cushing's disease
    - A middle aged woman presented with swollen rounded face, excessive deposition of fat in thorax and upper abdomen and excessive hair growth on face. Her fasting plasma glucose was 150 mg/dl and serum ACTH level was raised. She was most likely suffering from= Cushing's disease
- A 50-year-old female presents with hypertension and increasing weight. Which of the following features would be most suggestive of Cushing's syndrome rather than simple obesity? = Abdominal purple striae (if there is an option of proximal myopathy prefer that)
- A lady presents with round face, fat on neck and abdomen, hirsutism and raised ACTH. What is the diagnosis? = Cushing disease
- A 60-year farmer with Cushing symptoms? = Adrenal adenoma
- Hormone causing excess hair growth, hypertension, and other Cushing-like symptoms? = ACTH
- Cushing's disease results in increased ACTH in? = Venous blood draining the anterior pituitary
- A 35-year-old woman with a swollen, rounded face, fat deposition in the thorax, and raised ACTH levels likely has = Cushing's disease
- Female having hypotension, increase pigmentation and feature of Cushing disease. Hormone responsible= ACTH
- A lady with Hirsutism, Hyperglycemia, HTN and increase ACTH. Diagnosis= Cushing disease
- Long scenario of Cushing and symptoms, in the end there was adrenal mass= Cushing syndrome
- Cushing syndrome investigation= Increase cortisol, decrease ACTH
- Cushing syndrome most commonly due to= Exogenous steroid intake
- Characteristic of Cushing syndrome in an old lady=Reddish purple abdominal striae

HORMONES AND BLOOD PICTURE IN CUSHING'S DISEASE/SYNDROME

- Cushing syndrome is characterized by = Eosinopenia
- In Cushing disease=Hypokalemia
- Which of the following is most likely to lead to a metabolic alkalosis= Cushing's Disease
- A female presented with weight gain, round moon face, abdominal obesity with striae. The hormone causing these symptoms is a derivative of=Progesterone
- Hormones involved in Cushing disease are derived from = Cholesterol
- In an obese female with Cushing syndrome, there will be an increase in? = Glucose level
- Patient have Cushing's disease increased ACTH in=Venous blood draining the anterior pituitary
- Large dose of exogenous glucocorticoids decreases the plasma concentration of = ACTH
- ACTH effectively controls the secretion of? = Hydrocortisone
- The most potent effect of decreased ACTH is on = Adrenal androgens
- Increased neutrophils, decreased lymphocytes and eosinophils with increased serum ACTH level are indicative of = Cushing disease

- A diagnosed case of Cushing presented to ER and requires immediate surgery. Which of the following should be corrected before surgery=Hyperglycemia

SECONDARY HYPERALDOSTERONISM

- In a patient with CCF, secondary hyperaldosteronism occurs due to? = Renin
- What is the likely cause of secondary aldosteronism in chronic alcoholics? = Increased renin
- A 70-year-old male having congestive cardiac failure was brought to the hospital. The substance in his plasma most likely causing his secondary hyperaldosteronism is? = Renin

PRIMARY HYPERALDOSTERONISM (CONN SYNDROME)

- A man presented with HTN and hypokalemia. ABG's reveal a pH of 7.5, HCO3 32 mEq/L. Serum cortisol and urinary VMA within normal ranges but serum aldosterone is increased and plasma renin is decreased. What is the cause of HTN? = Conn syndrome
- Hypertensive man with hypokalemia. Diagnosis? = Conn syndrome

ADDISON'S DISEASE (PRIMARY ADRENAL INSUFFICIENCY)

- A lady presented with weight loss, lethargy, and palpitations for the last 6 months. Investigation shows normal urea, hyponatremia, and hyperkalemia. Diagnosis? = Addison's disease
- Feature of Addison's disease? = Hypoglycemia
- One of the following features of a patient with primary adrenal insufficiency is? = Hyperkalemia
- Sign of primary adrenal insufficiency is? = Hyperkalemia
- Patient with decreased neutrophils, increased lymphocytes and eosinophils, and increased ACTH level. Diagnosis? = Addison's disease
- A lady with a history of mild sore throat infection died. Autopsy report shows bilateral adrenal gland enlargement and cortical hemorrhages. Most likely organism involved was? = Neisseria meningitis

SHEEHAN SYNDROME

- A lady has a history of postpartum hemorrhage for which she received pints of blood ten days ago. She is brought to ER for hypotension with decreased levels of serum potassium, sodium, and glucose, and unable to lactate her child. What is the likely diagnosis? = Sheehan syndrome
- The most likely diagnosis for a postpartum patient with hypotension and hypoglycemia? = Sheehan syndrome
- A 31-year-old primigravida has a difficult delivery of a term infant. There is a loss of 1500 cc of blood. She has hypotension for 6 hours. Over the next month, her ACTH level decreases. Within the next 3 months, her adrenal glands become only about 2 grams each (normal 4 to 6 grams). This alteration of the adrenals is primarily due to which of the following cellular processes? = Atrophy of the cortex

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260. HISTOLOGICAL FINDING IN MELAS SYNDROME IS? = RAGGED RED FIBERS

DIFFERENT SYNDROMES RECENTLY CAME IN PAST PAPERS

ENDOCRINE AND METABOLIC SYNDROMES

- Lesion of arcuate nucleus of hypothalamus causes= Kallmann syndrome
- Kallmann's Syndrome shows? = Lesion in arcuate nucleus
- A woman with raised blood pressure (160/90) and serum potassium of 3.9 presents in the OPD. Her sister had similar complaints during pregnancy. What is the most likely diagnosis? = Geller syndrome
- The increased levels of 5-hydroxyindoleacetic acid in the urine is most commonly found in? = Carcinoid syndrome
- The increased levels of 5-hydroxyindoleacetic acid in the urine is most commonly found in= carcinoid syndrome
- Raised urinary excretion of 4-hydroxy 3-methoxy vinvyl mandelic acid (VMA) is commonly found in association with= Pheochromocytoma

RESPIRATORY AND THORACIC SYNDROMES

- Immotile cilia in Kartagener syndrome is due to defect in? = Dynein arm
- Sinusitis, bronchiectasis, and situs inversus are most closely associated with? = Kartagener's syndrome

MUSCULOSKELETAL AND CONNECTIVE TISSUE SYNDROMES

- Marfan syndrome occurs due to a mutation in a gene located on = Chromosome 15
- A scenario on Ehlers-Danlos syndrome with hypermobility and hyperextension, i.e., skin. Which type of Ehlers-Danlos syndrome is inherited by an autosomal recessive pattern? = Kyphoscoliotic EDS
- A 4-year-old boy with a short neck, low hairline, and fused cervical vertebrae likely has? = Klippel Feil syndrome

NEUROLOGICAL SYNDROMES

- Treatment of choice in Gilles de la Tourette's syndrome is? = Haloperidol
- Hyperkinetic syndromes, such as chorea and athetosis, are usually associated with pathologic changes in the? = Basal ganglia complex
- A female neonate presents with respiratory distress, micrognathia (small mandible), cleft palate, and glossoptosis. What is the most likely diagnosis? = Pierre Robin syndrome
- Syndrome associated with exophthalmos, difficulty in breathing, maxillary prominence, and facial hypoplasia? = Crouzon's syndrome
- A child with hypertelorism, oblique palpebral fissures, and ectropion likely has? = Crouzon syndrome
- Broad nose, syndactyly, and exophthalmos occur in? = Apert syndrome

CARDIOVASCULAR SYNDROMES

- The condition that initially presents with a left-to-right shunt before reversal is? = Eisenmenger syndrome

DERMATOLOGICAL AND HEMATOLOGICAL SYNDROMES

- A patient presents with nodules on the extensor surface of both legs, skin rash on the shins, hilar lymphadenopathy, and eye involvement. What is the most likely diagnosis? = Lofgren syndrome
- Skin rash on both shins, hilar lymphadenopathy, and eye involvement. Diagnosis is? = Lofgren Syndrome
- A 3-year-old child with recurrent infection and eczematous rashes presents to you with bloody diarrhea and normal IgA levels. What is the most likely diagnosis? = Wiskott-Aldrich syndrome
- Red man syndrome is caused by? = Vancomycin

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261. MIDDLE-AGED MALE WITH COMPLAINS OF LETHARGY. ON EXAMINATION BP 120/70, INVESTIGATIONS REVELS NA 140 MMOL/L, K =2.6 MMOL /L, BICARB 33 MMOL /L, WHICH OF THE FOLLOWING CONDITIONS IS MOST LIKELY TO BE RESPONSIBLE= BARTTER'S SYNDROME

REMEMBER

Condition	Blood Pressure	Plasma Renin	Aldosterone	Serum Mg++	Urine Ca++
Primary Hyperaldosteronism	↑	↓	↑		
Bartter syndrome	Normal	↑	↑		↑
Gitelman syndrome	Normal	↑	↑	↓	↓
Liddle syndrome	↑	↓	↓		

NOW LET'S SOLVE SOME PAST PAPER MCQ'S

- 26 years old male presented with hypertension and weakness. On investigation Serum potassium was LOW i.e., 2.5, Diagnosis= Conn's syndrome
- A 12-year-old boy is being investigated for fatigue. A physical examination, including blood pressure, is normal. Blood results show: sodium 135 mmol/L, potassium 3.1 mmol/L, what is the most likely diagnosis= Bartter's syndrome

- Hypokalemia may be seen in association with normal blood pressure in which of the following conditions= Bartter's syndrome
- Patient presented with hypertension, headache, polyuria and polydipsia. On investigation K=2.5, Na=148, pH=7.56, HCO3 29 cause= Conn's syndrome
- Patient with hypertension and Hypokalemia, (other lab values were given as well) = Liddle's syndrome
- Patient with metabolic alkalosis, Hypokalemia and normal B.P, diagnosis= Gitelman syndrome

262. ABOUT FOLLICULAR CA OF THYROID = VASCULAR INVASION

ABOUT THYROID CARCINOMA

Papillary carcinoma	General: ○ Popular (Most common thyroid cancer) ○ Palpable lymph nodes (Lymphatic metastasis is common) ○ Post radiation in head and neck (One of the causes) ○ Peerless prognosis (Excellent prognosis because it's slow growing) Histology: ○ Popping eyes (Clear nuclei, Orphan Annie Eyes) ○ Psammoma bodies
Follicular carcinoma	Faraway metastasis (Blood borne metastasis, invades capsule) Uniform Follicles. Diagnosis relies on the identification of capsular and/or lymphovascular invasion, because these tumors are in all other respects indistinguishable from follicular adenomas
Medullary carcinoma (C.2, MEN.2)	Originates from Parafollicular (C) cells of the thyroid. It produces Calcitonin, a Calcium-lowering hormone. Associated with MEN 2A and 2B
Anaplastic carcinoma	Tends to occur in older patients and has a very poor prognosis

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Good prognostic thyroid CA? = Papillary
- Most common thyroid cancer among the following? = Papillary carcinoma
- A female with a firm mass, 2cm left to mid-line. Isotope scan reveals a cold nodule. She has scattered local cervical lymphadenopathy. What is the most likely diagnosis? = Papillary carcinoma
- Which of the following is a slow growing thyroid tumor? = Papillary
- A baby with papillary carcinoma of thyroid with no family hx of cancer. What would be the risk? = Fetal period radiation exposur
- Follicular CA thyroid spreads through which one of the following mechanisms? = Vascular invasion
- Follicular carcinoma metastasizes first to? = Lungs
- Calcitonin producing CA? = Medullary carcinoma
    - It also comes as
        - Medullary thyroid carcinoma is related to the production of? = Calcitonin
        - Medullary carcinoma of the thyroid gland shows a rise in plasma levels of? = Calcitonin
- Medullary carcinoma of thyroid arises from? = Parafollicular cells of thyroid
- A patient with familial medullary carcinoma and a history of paroxysmal hypertension. The diagnosis is? = Pheochromocytoma
- Calcitonin is released in which malignancy? = Thyroid
- Calcitonin is given in? = Paget disease

DECT3, DECT4 AND INC. TSH, DIAGNOSIS= HYPOTHYROIDISM

	Hyperthyroidism	Hypothyroidism

- Hypokalemia may be seen in association with normal blood pressure in which of the following conditions= Bartter's syndrome
- Patient presented with hypertension, headache, polyuria and polydipsia. On investigation K=2.5, Na= 148, pH=7.56, HCO3 29 cause= Conn's syndrome
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2. ABOUT FOLLICULAR CA OF THYROID = VASCULAR INVASION

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- Calcitonin is released in which malignancy? = Thyroid
- Calcitonin is given in? = Paget disease

DEC T3, DEC T4 AND INC. TSH, DIAGNOSIS= HYPOTHYROIDISM

	Hyperthyroidism	Hypothyroidism

Features	Mnemonic (**SWEATING**) ○ **S**weating ○ **W**eight loss ○ **E**motional (anxiety) ○ **A**ppetite increased ○ **T**remor/ **T**achycardia ○ **I**ntolerance of heat/ **I**rregular menstruation/ **I**rritability, ○ **N**ervousness ○ **G**oiter and **G**I problems (diarrhea)	Mnemonic (**MOM'S C**ontinuously **BORED**) ○ **M**ore common in females, occurs mainly in middle life ○ **O**besity ○ **M**enorrhagia ○ **S**kin and hair dryness (Puffy skin) ○ **C**onstipation ○ **B**radycardia ○ c**O**ld intolerance. ○ **R**aised BP (diastolic) ○ **E**nergy levels fall. ○ **D**epression/ **D**elayed relaxation of reflexes
Labs	↑ T3 and T4 ↓ TSH	↓ T3 and T4 ↑ TSH

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

HYPOTHYROIDISM

- A 50-year-old housewife complains of weight gain, fatigue, deepening of her voice, dry skin, constipation and cold intolerance. Diagnosis? = Hypothyroidism
- Obese woman, who's always cold, gaining weight. What investigation should be done next? = TSH
  - It is also asked as
    - A female complains of weight gain, fatigue, palpitations, cold intolerance, and amenorrhea. Investigation for diagnosis is? = TSH
    - A female presents weight gain despite loss of appetite, uses warm clothes in hot summer, and intolerance to cold. Next best investigation will be? = TSH level
- Hypothyroidism due to thyroid gland disease is associated with increased level of? = Cholesterol
- In hypothyroidism, what will increase? = TSH
- Primary hypothyroidism is usually characterized by increased levels of? = TSH
- After hypophysectomy, thyroxin should be given to? = Prevent hypothyroidism
- Most common cause of fetal hypothyroidism? = Thyroid dysgenesis

HYPERTHYROIDISM

- A female with mood swings, weakness, and palpitations, she also experienced excessive sweating. Diagnosis? = Hyperthyroidism
- Raised T3 and T4 and decreased TSH occur in? = Primary hyperthyroidism
- A 25-year-old female has presented with nervousness and loss of weight. Her thyroid profile shows free T4 30 nmol/L, T3 2.8 nmol/L, and TSH 0.1 u/L. This patient is most likely suffering from? = Primary hyperthyroidism
- A common feature in hyperthyroidism, diabetes, and anorexic patients? = Weight loss
- A common feature in Type 1 DM, hyperthyroidism, and anorexia nervosa? = Weight loss
- What decreases in hyperthyroidism? = Weight
- Thyroid scan? = To find out if the nodule is cold or normal thyroid

KNOW THE DIFFERENCE

- A 46-year-old man has palpitations and sweating. His plasma thyroid stimulating hormone concentration is low and increases markedly when he is given thyrotropin releasing hormone. Which of the following is the most likely diagnosis= Hyperthyroidism due to an abnormality in the hypothalamus
  - It also comes as
    - A 46-year-old man has "puffy" skin and is lethargic. His plasma thyroid-stimulating hormone concentration is low and increases markedly when he is given thyrotropin-releasing

hormone. Which of the following is the most likely diagnosis= Hypothyroidism due to an abnormality in the hypothalamus

- Note--- Lethargy and myxedema indicate hypothyroidism. Low TSH levels suggest a hypothalamic or pituitary issue. A normal pituitary response to TRH administration points to insufficient TRH production by the hypothalamus.

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54. THE FIRST STEP IN THYROID HORMONE SYNTHESIS IS=OXIDATION OF FREE IODINE

KNOW THE DIFFERENCE AND THESE PAST PAPER MCQS

- First step in thyroid hormone formation involves binding of iodine to=Tyrosine
- First step in deactivation of thyroid hormone in liver= Deiodination
- First step in deactivation of TSH = Demethylation
- Regarding thyroid hormones, maximum concentration? = T4
- Thyroid hormone is inactivated in the peripheral system by the liver through? = De-iodination
- High affinity of thyroid receptors is for? = Free Tri-iodothyronine
- Thyroglobulin is synthesized by which cells? = Follicular cells
- Thyroid hormones are produced by? = Follicular cells

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55. PATIENT WITH MARKEDLY DECREASE TSH, INCREASE T3 WHAT IS THE DIAGNOSIS=HYPERTHYROIDISM

NOTE THAT

Diseases	TSH	T3, T4
Hypothyroidism	↑	↓
Hyperthyroidism	↓	↑
Subclinical hypothyroidism	↑	Normal
Sick euthyroid syndrome	↓	↓

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Patient on thyroxine what should be monitored=TSH
- What will be the labs in primary hypothyroidism= High TSH
- Best single test for hyperthyroidism=TSH
- Most Active form of thyroid hormones is in state of=Free T3
- Active form of thyroid are in state of=Free form
- Hormones which are actively involved in metabolism= Free thyroid hormones
- Increased t3 and t4 in pregnancy due to= Inc. TBG
- T4 in the blood mostly binds with which plasma protein= TBG
- Which form of thyroxin is an active form= Unbound form
- In which of the following Reverse T3 is more than T3= Fetus
- Reverse T3 is present in abundance in body= Fetus
- Hypothyroid patient taking treatment. Most appropriate test for monitoring is done by= TSH
- Raised T3 and T4 and decrease TSH occur in=Primary hyperthyroidism
- Propranolol is given in anti-thyroid treatment as=Increases reverse T3
- All Active thyroid hormones in the circulation are in the form of=Triiodothyronine

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56. PRIMARY HYPOTHYROIDISM= DECREASE T3, DECREASE T4, INCREASE TSH

NOTE THE MAIN FEATURES OF THYROID DISEASES

Hyperthyroidism	**Graves' disease** ❖ Most common cause of hyperthyroidism ❖ Type II hypersensitivity reaction ❖ Thyroid-stimulating immunoglobulin (TSI), thyroid growth immunoglobulin (TGI) stimulates increases production and glandular hyperplasia and enlargement respectively ❖ Besides all other clinical signs and symptoms of hyperthyroidism there is Pretibial myxedema (infiltrative dermopathy) and Exophthalmos
	Thyroid storm ❖ Life-threatening condition, associated with untreated or undertreated hyperthyroidism ❖ Presents with tachycardia (>140 bpm), agitation, restlessness, fever, diarrhea, coma, and tachyarrhythmia (cause of death).
	Subacute (De Quervain's) thyroiditis ❖ Thought to occur following viral infection and typically presents with hyperthyroidism, Painful goiter, Self-limiting
Hypothyroidism	❖ Hypothyroidism manifests as myxedema in adults or as Cretinism in Children Hashimoto thyroiditis ❖ Hypothyroidism + goiter + anti-TPO antibodies (antimicrosomal) and antithyroglobulin antibodies.
	Cretinism (Congenital hypothyroidism) ❖ Characteristics (6 P's) ○ Poor brain development (Severe mental retardation) ○ Protuberant tongue (Large tongue) ○ Protuberant abdomen, Protruding umbilicus (umbilical hernia) ○ Puffy-faced child
	Other Causes of Hypothyroidism ❖ Goitrogens (e.g., Amiodarone, lithium),

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

CRETINISM

- ❖ Cretinism differs from dwarfism in? = Severe mental backwardness
- ❖ A pregnant woman presented with her 3-year-old child, who had a protruding (pot) belly and a large tongue. The mother was advised to take iodine to prevent? = Cretinism
- ❖ Most common cause of congenital hypothyroidism? = Thyroid dysgenesis / defective embryogenesis
- ❖ A baby has mental retardation, coarse and dry skin, and sluggish body activities. The most probable cause of the condition is? = Thyroid atrophy
- ❖ Long scenario of cretinism in a baby. What will be the condition of the thyroid? = Atrophy
- ❖ Fetal brain growth is by which hormone? = Thyroid hormone
  - o It also comes as
    - ▪ Which hormone influences brain development during fetal life? = Thyroid hormone
    - ▪ 13-year-old looking likea 9-year-old girl with mental retardation. Hormone involved? = Thyroid (congenital hypothyroidism)

GRAVES' DISEASE

- ❖ Regarding Graves' ophthalmopathy, correct is? = Causes optic nerve compression
- ❖ The type of hypersensitivity reaction that occurs in Graves' disease is? = Type 2
- ❖ Blood levels of which of the following substance is increased in Graves' disease? = Triiodothyronine (T
- ❖ A patient with exophthalmos, hyperthyroid features, and positive anti-thyroid antibodies likely has? = Graves' disease
  - o It also comes as
    - ▪ The most likely diagnosis for a patient with exophthalmos, goiter, and elevated T4 and low

    TSH? = Graves' disease
  - Thyrotoxicosis, goiter, and exophthalmos are the classic clinical features of? = Graves' disease
  - A 30-year-old female with exophthalmos, goiter, and antithyroid antibodies has? = Graves' disease

- A patient with hyperthyroid features and positive anti-thyroid antibodies is suggestive of? = Graves' disease
- Which of the following tests will help investigate a patient suffering from Graves' disease? = Anti-TSH antibodies
- Exophthalmos in Graves' disease occurs due to? = Increase TSI
- Autoimmune thyroid disease with increased TSI antibodies. Diagnosis? = Graves' disease
- What is the most common cause of hyperthyroidism? = Graves' disease
- Ophthalmopathy develops due to deficiency of which vitamin? = Vitamin D
  - Note: Vitamin D deficiency is significantly associated with ophthalmopathy in patients with Graves' hyperthyroidism.

HASHIMOTO'S THYROIDITIS

- A 28-year-old lady with diffuse goiter presents with a history of weight gain and intolerance to cold weather. Pulse rate was 64/min regular. The investigation most likely confirming Hashimoto thyroiditis would be? = Antimicrosomal and thyroglobulin antibodies
  - It also comes as
    - A young woman with goiter, cold intolerance, and weight gain was diagnosed with Hashimoto thyroiditis. Which test should be done for confirmation? = Antimicrosomal and anti-thyroglobulin antibodies
    - A person diagnosed with Hashimoto thyroiditis will have the following antibodies in his blood? = Anti-microsomal and antithyroglobulin
    - A young woman with goiter, cold intolerance, and weight gain was diagnosed as Hashimoto thyroiditis. Which test should be done for confirmation? = Antimicrosomal and anti-thyroglobulin antibodies
- A 40-year-old known hypothyroidism female was referred to an endocrinologist for a mass in the neck. FNAC shows increased lymphocytes and serology was advised. What is the most probable cause? = Hashimoto thyroiditis
  - It also comes as
    - A 40-year-old female patient has an enlarged thyroid and evidence of hypothyroidism. Fine needle aspiration shows a large number of lymphocytes. She is also advised some serological tests by the endocrinologist. The most likely diagnosis in this case is? = Hashimoto's thyroiditis
    - Diagnosis of enlarged thyroid with hypothyroidism and a large number of lymphocytes? = Hashimoto's thyroiditis
- Investigation for Hashimoto thyroiditis? = Anti-thyroglobulin and anti-TPO
- A 58-year-old woman with yellow eyes and hypothyroidism likely has autoantibodies to? = Anti-mitochondrial
- Example of autoimmune disease involving a single organ? = Hashimoto thyroiditis

GENERAL THYROID PATHOLOGY

- Hypothyroidism is associated with an increase in? = Cholesterol
- Common cause of multinodular goiter? = Fluctuating increase in TSH
- A mass in the midline, biopsy done, normal thyroid tissue. What will be seen on histology? = Cuboidal follicular
- Thyroid swelling moving on deglutination because it's attached to? = Pre-tracheal fascia

[illegible]-MONTH PREGNANT LADY WITH THYROTOXICOSIS, DRUG OF CHOICE = METHIMAZOLE

NOTE:

- PTU used in first trimester of pregnancy (due to methimazole teratogenicity)
- Methimazole used in second and third trimesters of pregnancy (due to risk of PTU-induced hepatotoxicity).

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- A 20-year-old lady at 10 weeks gestation is diagnosed with hyperthyroidism. Which of the following options would be most suitable? = Propylthiouracil
- Propylthiouracil is the drug of choice in? = Grave disease in 1st trimester
- Propylthiouracil produces its useful actions in hyperthyroidism by inhibiting? = Synthesis of thyroid hormone
- A pregnant hyperthyroid lady during her 5th month of pregnancy presents with thyrotoxicosis. Which ant thyroid drug should be given? = Methimazole
- Treatment of hyperthyroidism in pregnant women at 20 weeks? = Methimazole
- A pregnant lady during her 3rd trimester presents with thyrotoxicosis. The drug of choice for her will be? = Methimazole
- Maternal thyroid was diagnosed. Which drug crosses placenta and is teratogenic? = Methimazole
- Patient had ↑↑TSH, ↓T3, and ↓T4. What drug will you prescribe? = Levothyroxine
- Which of the following crosses placenta in a pregnant female with thyroid disease and affects fetus? = PTU (Propylthiouracil)
    - (Acc to few students methimazole was not in options but if it is in option prefer methimazole-- remember methimazole is teratogenic while PTU causes hepatotoxicity and aplastic anemia)

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268. INC. LEVEL OF THYROID HORMONES IN PREGNANCY IS DUE TO= TBG

REMEMBER

- In Hepatic Failure
    - Plasma proteins↓, TBG ↓ → ↓ total thyroid hormones, but normal levels of free hormone
- In Pregnancy:
    - TBG ↑ → ↑ total thyroid hormone, but normal levels of free hormones (i.e. clinically euthyroid)

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269. WHICH ONE OF THE FOLLOWING CAUSES HYPOCALCEMIC TETANY= HYPOPARATHYROIDISM

NOTE THE FOLLOWING RESPONSIBLE FOR CA++ REGULATION

PTH Mnemonic: (PTH) → **P**hosphate **T**rashing **H**ormone	❖ ↑ Serum Ca^{2+}, ↓ PO4.	❖ ↑ Bone resorption and kidney reabsorption (at distal convoluted tubules) of Ca^{2+} ❖ ↑ Bone resorption of PO_4, ↓ reabsorption of PO_4 in kidneys PCT. ❖ ↑ $1,25\text{-}(OH)_2 D_3$ (calcitriol) production by stimulating kidneys ❖ Overall effect → o It acts directly on kidney and bone, and indirectly on the gastrointestinal (GI) tract o ↑ Serum Ca2+ (major hormone for regulation of Ca2+) by decreasing urinary calcium excretion and increasing ca++ absorption o ↓ Serum PO4 and ↑ urine PO4
Vitamin D	❖ ↑ Serum Ca^{2+}, ↑PO4.	
Calcitonin	❖ ↓ Serum Ca^{2+}	❖ Calcitonin opposes actions of PTH. ❖ Secreted by Parafollicular cells of thyroid. ❖ Can be used to treat hypercalcemia

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

VITAMIN D

- Specific function of Vitamin D? = Calcium reabsorption from the kidney
- The correct sequence for Vitamin D activation is? = 25 hydroxylation in the liver & 1 hydroxylation in the kidney
- Cause of Vitamin D resistant rickets? = Fanconi syndrome
- A young lean boy with radius fracture develops tetany on taking BP. His serum calcium is 6.8, urinary calcium 50 mg/day. What is the cause? = Vitamin D deficiency

PTH ACTIONS AND REGULATION

- What manages the levels of phosphate and calcium? = PTH
- Levels of Ca and phosphate are mainly regulated by? = PTH
- PTH action on renal tubules? = Inhibit phosphate absorption in PCT
- Parathyroid hormone acts by which mechanism to increase blood Ca level? = Increase reabsorption of Ca++ from distal convoluted tubules
- Indirect effect of parathyroid hormone? = Intestinal Ca++ absorption
- Preprohormone? = PTH
- 1, 25 OH cholecalciferol is regulated by? = PTH
- Hyperparathyroidism will lead to? = Decrease phosphate
- Metastatic calcification in the kidney is caused by? = Hyperparathyroidism

PARATHYROID HORMONE (PTH)

- Primary hyperparathyroidism is most common in? = Post-menopausal women
- A 45-year-old woman presented with a fracture neck of femur. Serum calcium is 12.1. What is the most likely cause? = Hyperparathyroidism
- A 65-year-old woman is referred by her GP following a routine blood test which showed a raised serum calcium. Over the last few months, she has become constipated with intermittent bouts of abdominal pain. She is lethargic and her mood has been very low. Clinical examination is unremarkable. Biochemical results show a corrected serum calcium of 2.95 mmol/L and a serum parathyroid hormone of 24 pmol/L. Which is the single most likely diagnosis? = Primary hyperparathyroidism
- Increase serum Ca++, decrease PO4, increase PTH, and increase urinary Ca and microhematuria. Diagnosis? = Primary hyperparathyroidism
- A woman underwent thyroidectomy. After some days or weeks, she came to the doctor with paresthesia and spasm. Cause? = Hypocalcemic tetany (caused by hypoparathyroidism but mainly due to hypocalcemia)
- 10 days post-thyroidectomy, the patient most likely presents with muscle spasm and paresthesia. Likely cause? = High PO4, low Ca, and hypocalcemic tetany
- 10 days after thyroidectomy, the patient presented with spasm complaints. Diagnosis? = Hypocalcemic tetany

MISCELLANEOUS CONDITIONS

- Calcitonin can be given in= Paget's disease
    - Note: Calcitonin cannot be given in thyrotoxicosis.
- A chronic CRF patient on dialysis. Most probable autopsy finding? = Hypertrophied PTH gland
- PTH is not affected by which of the following? = Osteoporosis

270. **SCENARIO OF INCREASE PARATHYROID BUT HYPOCALCEMIA. CAUSE= RENAL FAILURE**

- **Also note that → removal of the parathyroid glands is one of the recognized complications of thyroidectomy.**
- **LEARN THE CAUSES OF HYPERPARATHYROIDISM**

Condition	Causes	S.Ca	S.PO₄	PTH	Features
Primary hyperparathyroidism	❖ Parathyroid adenoma (most common) ❖ Parathyroid carcinoma	↑	↓	↑	Mnemonic: **Painful Bones, Renal Stones, Abdominal Groans And Psychic Moans** Painful bones: fractures, osteoporosis, Osteitis fibrosa cystica Renal stones due to ↑ Ca++ Abdominal groans → constipation due to ↑ Ca++ Psychic moans→ depression, seizures
Secondary hyperparathyroidism	❖ Chronic renal failure ❖ Vitamin D deficiency	↓	↑	↑	Renal osteodystrophy
Tertiary hyperparathyroidism	❖ Refractory (autonomous) hyperparathyroidism resulting from chronic renal failure. ❖ Prolonged secondary hyperparathyroidism, in which continuous stimulation results in parathyroid adenoma and autonomous PTH secretion	↑	↑	↑	

NOW LET'S DISCUSS SOME PAPER PAST MCQ'S

- Chronic renal failure patient died. Which gland are hypertrophied= Parathyroid
- Patient was having neck mass and has done surgery for that, now he has Hypocalcemia, Hyperphosphatemia & after giving injection of PTH the amount of cAMP in Urine increases, what's the underlying cause= Post-Surgical Hypoparathyroidism
- What manages the levels of phosphate and calcium= Parathyroid
- Action of parathyroid hormone= Stimulation of adenylate cyclase
- Renal failure patient with lumbar pain, renal stone, Ca 13, punched out lesions= Hyperparathyroidism
- A 58yr old Diabetic Patient developed bone pain in his hands. On exam, no joint abnormalities were noticed. His labs were: Serum Ca>>7.8 Serum PO4>> 5.7 Serum Creat was 7.8. What is the most likely cause of his complains= Hyperparathyroidism (tertiary hyperparathyroidism due to renal failure or parathyroid adenoma)
- VIT-D resistant rickets causes= Fanconi syndrome
- After 10 days of thyroidectomy, patient will present with =Decrease calcium and increase muscle cramps
- After 10 days of thyroidectomy, patient will present with= High po4 and low Ca and tetany
- Partial thyroidectomy done for= To save parathyroid gland
  - It also comes as
    - ✓ Posterior thyroid is spared during thyroid surgery to avoid damage to=Parathyroid gland
    - ✓ During thyroid surgery the Posterior part of thyroid gland is spared for=Parathyroid gland

271. HYPOTHALAMUS INHIBITS THE FOLLOWING HORMONE= PROLACTIN

ALSO REMEMBER THAT (PAST PAPER MCQ's)

ADH (ANTIDIURETIC HORMONE)

- Lesion in the supraoptic nucleus will lead to decreased secretion of? = ADH
- ADH is primarily synthesized in the? = Supraoptic nucleus
- ADH and vasopressin originate in? = Hypothalamus
- A man with increased thirst and changed behavior, urine osmolarity decreased. There is a lesion of? = Hypothalamus

OXYTOCIN

- Which is an example of a neuro-hypophysial hormone? = Oxytocin
- Vasopressin and oxytocin originate in the? = Hypothalamus
- Which of the following is secreted by the posterior pituitary? = Oxytocin
- Posterior pituitary is involved in labor via? = Oxytocin

PROLACTIN

- Which hormone of the anterior pituitary is under direct inhibitory control of hypothalamus? = Prolactin
- 15-year-old tall girl with mammary discharge and increased prolactin will show? = Increase in eosinophils
- A patient develops signs and symptoms of growth hormone and prolactin excess. The type of cells most likely to be increased in the pituitary is? = Eosinophilic cells

OTHERS

- Which hormone is responsible for hypothalamic-pituitary axis feedback for ovulation? = GnRH
- A 30-year-old woman has the anterior lobe of her pituitary gland surgically removed because of a tumor. Without hormone replacement therapy, which of the following would occur post-surgery? = Absence of menses
- Which hypophyseal structure receives signals from the hypothalamus via the hypophyseal portal vein? = Adenohypophysis

272. TYROSINE DERIVATIVE DOESN'T INCLUDE = PROLACTIN

- Tyrosine derivatives are → dopamine, nor-epinephrine and epinephrine, thyroid
- Scenario of a pt with Heat intolerance, exophthalmos, weight loss (all signs of hyperthyroidism). These symptoms are caused due to increase in secretion of a hormone which is derived from which of the following=Tyrosine

ALSO REMEMBER THESE MCQS

- Dietary precursor of serotonin is=Tryptophan
- Mononuclear phagocytosis originates from precursor cells in= Bone marrow

273. WHICH OF THE FOLLOWING IS THE IMMEDIATE EFFECT OF INSULIN=POTASSIUM ENTRY INTO THE CELL

REMEMBER

- ✓ The basic metabolic function of insulin at cellular level is=Entry of glucose in cells
- ✓ Delayed action of insulin is=Stimulate mRNA for lipogenesis

274. POSITIVE FEEDBACK MECHANISM ALSO KNOWN AS VICIOUS CYCLE IS SEEN IN= CHILD BIRTH

ALL THE QUESTIONS RELATED TO POSITIVE OR NEGATIVE FEEDBACK

- Blood flow to kidney is regulated by= Tubuloglomerular feedback
- Negative feedback= Makes value shift towards mean
- Pt is unconscious, BP not recordable. Pulse thready, negative feedback of aortic and carotid in increased due to= Arterial PCO2

- Progressive development of HTN. What is problem= Negative feedback
- Autoregulation of kidney is done by= Myogenic and Tubuloglomerular feedback system
- Result opposite to initial change is=Negative feedback
- Example of positive feedback is=Child birth
- Co2 transport is an example of=Negative feedback
- Main role of feedback inhibition= Bring hormone to normal level
- The internal environment remains static via=Negative feedback

275. AT PUBERTY, THE EFFECT OF TESTOSTERONE IS=THICKENING OF LARYNGEAL CARTILAGES

ALL MCQS ABOUT PUBERTY

- Young girl is ready for reproduction, which sign shows it=Menarche
- Last stage of puberty in girls= Menarche
- First sign in onset of puberty is=Breast bud appearance
  - It also comes as
    - First sign in onset of puberty is=Thelarche
- Puberty is caused due to=Increase production of gonadotropin
- Role of testosterone during puberty is=Thickening of laryngeal cartilage and deepening of voice
- Puberty is caused due to= Increase production of gonadotropin

276. NUMBER OF MATURE SPERM IN 1 ML OF SEMEN= 100 MILLION

ALL ABOUT SPERM AND SEMEN (FROM PAST PAPER MCQS)

- Normal sperm velocity → 1-4 mm/min
- Amount of semen ejaculated during each coitus → 3.5 ml
- Total no of sperm in 1 ml of semen is → 100-120 million sperm
- Total no of sperm in 1 ejaculation is → 400 million
- Total no of sperm needed for fertility in each ml → 20 million
- Full regeneration of sperms takes how many days= 64 days
- In male genital ducts, sperm can live upto → Several weeks

WHILE

- In female genital tract, sperms life span is → 24-72hrs
- In female genital tract, sperms Stays active for → 24-48hrs

277. RENAL THRESHOLD FOR GLUCOSE= 200 MG/DL

REMEMBER

- First aid and many other standard books states 200,
- Chatterjee says 180,
- BRS says 250.
  - Follow the book you like, i am with First aid (CPSP favorite)

278. IN SPERMIOGENESIS ACROSOME REACTION BY = LYSOSOMES

- While acrosome formed by= Golgi

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Acrosome of sperm is formed by= Golgi apparatus
- Sperm in epididymis= Has directional movement
- Acrosome of sperm contains= hyaluronidase (proteolytic enzyme)
- Which structure contains lysosomal like enzymes= acrosome
- Acrosome cap synthesis from= Golgi complex
- Acrosome synthesized by= Golgi apparatus

- The part of the sperm containing proteolytic enzymes to digest the zona pellucida is the= acrosome
- The ovum is surrounded by a non-cellular layer known as= Zona pellucida

NEUROLOGY

279. **BABY BORN ON 4TH DAY MOST COMMON CAUSE OF MENINGITIS = GROUP B STREPTOCOCCI**

REMEMBER THE CAUSES: REPEATEDLY ASKED IN EXAM, GIVEN IN ORDER OF PREFERENCES

- Remember if asked meningitis after lung abscess always click= Staph aureus
- Meningitis + rash = Neisseria

Newborn (0–6 Mo)	Children (6 Mo–6 YR)	6–60 YR	#1 cause in teens	In HIV
Group B streptococci. E. coli	S. pneumoniae N. meningitis H. influenzae type B	S pneumoniae N meningitidis	N meningitidis	Cryptococcus spp.

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

NEONATES (0–28 DAYS)

- Cause of meningitis in a 5-day-old baby? = Streptococcus agalactiae
- 48-hour-old newborn suffering from meningitis. Causative agent? = Streptococcus (Group B Streptococcus)
- Organism causing meningitis in newborn? = Streptococcus Lancefield B
- A mother delivered a child at home. After 5 days, the baby presented in hospital with neck stiffness and fever. The cause of meningitis? = Streptococcus agalactiae (Group B Strep)
- A 5-day-old baby with neck stiffness, vomiting, and fever. The cause of meningitis is? = Streptococcus agalactiae (Group B Strep)

OTHERS (6 MONTHS TO 60 YEARS)

- Bacterial meningitis in children aged 6 months to 2 years is most commonly caused by? = Haemophilus influenzae
- In a 3-year-old child who presented with meningitis and ear pain, the causative gram-negative coccobacilli could be? = H. influenza
- 6 months to 2 years of age cause of meningitis? = Streptococcus pneumoniae
- A 10-year-old boy presents with fever, body aches, headache, and a rash around his ankles. Lumbar puncture showed increased proteins and neutrophils more than lymphocytes. The organism likely seen on Gram staining belongs to? = Gram-negative diplococci
- A 60-year-old patient presented with meningitis. Causative agent? = Streptococcus pneumoniae
- A drowsy 85-year-old man who had a splenectomy 20 years ago was brought to the emergency department with a clinical diagnosis of meningitis. The bacteria most likely to be isolated from CSF would be? = Streptococcus pneumoniae
- The most likely feature of Streptococcus pneumoniae? = It is a common etiological agent in meningitis
- Most common cause of septic meningitis? = Streptococcus
- Meningitis in HIV patient is likely caused by which organism? = Cryptococcus neoformans

280. **PATIENT IN SEMICONSCIOUS CONDITION CSF SHOWS GLUCOSE WAS 20 MG, PROTEIN WAS 1500MG, DIAGNOSIS? = ACUTE BACTERIAL MENINGITIS**

REMEMBER

	Cell Type	Protein	Glucose
Normal values	WCC 0-5 cells/µL	20-40 mg/dL	45-80 mg/dL (less than 2/3rd of blood glucose)
Bacterial	↑PMN'S	↑ (> 1g/L)	↓ (1/2 of plasma)
Fungal/TB	↑LYMPHOCYTES	↑ (> 1g/L)	↓ (1/2 of plasma)
Viral	↑LYMPHCYTES	↑/Normal	Normal or 80% of plasma glucose ❖ Remember: Mumps and herpes encephalitis unusually causes a low glucose level

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

NEISSERIA MENINGITIDIS

- 25-year-old female presents with fever, neck stiffness, and a maculopapular rash. Organism involved? = Neisseria meningitides
  - It also comes as
    - 25-year-old patient with meningitis and rashes? = Neisseria meningitis
- A lady with a history of mild sore throat infection died. Autopsy report shows bilateral adrenal gland enlargement and cortical hemorrhages. Most likely organism involved? = Neisseria meningitis
- A 9-year-old boy presented with high-grade fever and neck rigidity. Gram staining reveals cocci in culture. Which organism is likely involved? = Neisseria meningitis
- Regarding antimicrobial susceptibility of Neisseria meningitidis, the most appropriate statement is? = Penicillin G is the drug of choice

CRYPTOCOCCUS NEOFORMANS (FUNGAL MENINGITIS)

- An immunocompromised person develops meningitis. Which organism is likely involved? = Cryptococcus
  - It also comes as
    - A patient recently diagnosed with HIV/AIDS presents with diarrhea and meningoencephalitis. Under microscopy, the organism stains positive with India ink. This opportunist organism could likely be? = Cryptococcus neoformans
    - A 38-year-old HIV-positive patient is complaining of headache. On examination, neck stiffness is positive. Fungal meningitis is suspected to be the cause. Which of the following is thought to be the number one cause in HIV/AIDS patient? = Cryptococcus neoformans
- Which antifungal agent is useful in the treatment of Cryptococcus neoformans meningitis? = Amphotericin B
  - It also comes as
    - A patient presents with headache, fever, and vomiting and is diagnosed with meningitis. CSF result shows Cryptococcus. Drug of choice? = Amphotericin B
- A known Hodgkin lymphoma patient presents with high-grade fever and vomiting. O/E neck stiffness and Kernig sign was positive. CSF shows a fungal organism. Which organism is most likely responsible for it? = Cryptococcus
- The most common cause of fungal meningitis in HIV/AIDS patients? = Cryptococcus neoformans

BACTERIAL MENINGITIS

- A young patient presented with headache, neck stiffness, and fever. CSF R/E proved the diagnosis of bacterial meningitis. Which of the following feature will be there in CSF? = Increase proteins
- Scenario on meningitis with just high protein, low glucose? = Bacterial meningitis
- Drug of choice in bacterial meningitis? = Ceftriaxone
- Drug of choice in pyogenic meningitis? = Ceftriaxone

- A 30-year-old male presented with meningitis with low glucose and increased polymorph cells and positive meningeal signs. Drug of choice? = Penicillin G (prefer Ceftriaxone if in options)
- A 60-year-old patient presented with meningitis. The causative agent in him is? = Streptococcus pneumoniae
- A mother delivered a child at home. After 5 days, the baby presented in hospital with neck stiffness and fever. Cause of meningitis? = Streptococcus agalactiae (Group B Strep)
- An 85-year-old patient underwent splenectomy after which he develops meningitis. Causative organism? = Streptococcus

TUBERCULOUS MENINGITIS (TBM)

- Scenario of meningitis given with a CSF sugar of 40 and predominance of lymphocytes. Diagnosis? = Tuberculous meningitis
- Meningitis, CSF analysis shows CSF lymphocytes 75% while neutrophils 25%. Diagnosis? = Tuberculous meningitis
- A young male is admitted with a history of fever and unconsciousness. His CSF shows WBC 400/, 75% lymphocytes, neutrophils 20%, turbid appearance, protein 2.1 g, glucose 50 mg. Diagnosis? = TB meningitis
- A person has high-grade fever, neck rigidity. LP shows glucose 40 mg, protein 400 mg, prominent cells (lymphocytes). The most likely diagnosis is? = TBM
- LP done of a comatose patient as he had fever. It shows CSF lymphocytes 75%, neutrophils 25%, proteins 2.5 mg, glucose 50 mg, and turbid CSF. Diagnosis? = TB meningitis
- A 10-year-old child with a convergent squint, temperature of 100°F, and gradually disturbed behavior is most likely diagnosed with? = TB meningitis
- A 10-year-old boy presents with fever, body aches, headache, and neck stiffness. Laboratory investigation shows: Protein 400 mg%, Glucose 40 mg%, total leukocyte count of 450 per cmm (mostly lymphocytes). The most likely diagnosis? = Tuberculous meningitis
- A young male is admitted with fever and unconsciousness. His CSF shows 400 WBCs, 75% lymphocytes, 20% neutrophils, and a turbid appearance. The diagnosis is? = Tuberculous meningitis
- Color of CSF in TB meningitis? = Opalescent

VIRAL MENINGITIS

- Picture of meningitis with low-grade fever and CSF Proteins 45 mg/dL, Glucose 80 mg/dL, Serum Glucose 110 mg/dL, and normal cell count. Diagnosis? = Viral meningitis
- LP done of a comatose patient as he had fever and neck rigidity. CSF showed increased lymphocytes while proteins and glucose normal. Diagnosis? = Viral meningitis
- An old alcoholic patient developed unconsciousness and one episode of fits. CSF protein 45, glucose 80 (plasma 110), no inflammatory cells, rest was normal. Organism involved? = HSV
- A patient who is HIV positive presents with fever for 4 to 5 days and vomiting for 1 day. CSF analysis shows: Glucose 80 mg/dL, BSR 110 mg/dL, Protein 45 mg/dL, with no cells raised. What is the most likely cause of the symptoms in this HIV-positive patient? = Herpes Encephalitis

COMPLICATIONS OF MENINGITIS

- Meningitis loss of hearing? = Damage to organ of corti (if bilateral, involvement of neural pathways)
- Patient with meningitis develops B/L hearing loss. Diagnosis? = Involvement of neural pathways
- A 30-year-old male who was treated for meningitis one month back has a complaint of morning headache. O/E there is bilateral papilledema. Likely cause? = Hydrocephalus
- History of meningitis one month back, B/L papilledema? = Hydrocephalus
- A patient with morning headache and bilateral papilledema post-meningitis likely has? = Hydrocephalus

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WHEN TENSION IN MUSCLE INCREASES NEAR TO RUPTURE WHAT DOES THE RELAXATION = GOLGI TENDON ORGANS (GTOs)

REMEMBER

- Muscle Spindles: Innervated by 1α fibers - cause skeletal muscle to CONTRACT.
- GTOs: innervated by 1β - cause contracting muscle to RELAX ---Prevents the muscle from tearing
- Thus, Excessive stretch will be prevented by = GTO's

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- 1b fibers innervate= Golgi tendon
- Under tension what prevents tearing/overstretching= GTO
- Clasp knife reflex due exaggerated response of = GTO's
- Analysis of the clasp knife reflex suggests that the reflex most likely= Arises primarily from Golgi tendon organs
- A cat is decerebrated at mid-collicular level. Which of the following happens=Exaggerated stretch and tendon jerk reflex
- A young healthy man he lifts 150 LB weight and holds it there for 5 seconds, suddenly his arms give way and drops the weight to the floor. Which of the following receptors is responsible for this sudden muscle relaxation=Golgi Tendon Organ
- When a strong stretch is applied to the skeletal muscle, it undergoes relaxation, which is due to the stimulation of= Golgi tendon organs
    - ✓ It also comes as
        - Reflex arc is a negative feedback mechanism (inverse stretch) preventing too much tension on the muscle and tendon. This reflex is elicited by= Golgi tendon organ
        - Receptors which prevent tearing of muscles when muscle tension becomes high are= Golgi tendon organs
        - Discharge of impulses from Golgi tendon organs present in a muscle along 1b nerve fibers to the spinal cord results into= Relaxation of the muscle
        - During voluntary movement, Golgi tendon organs inform central nervous system about= Tension developed in the muscle being moved
        - Golgi Tendon organ detects tension in= Agonists
        - The structure which prevents muscle from tearing under a constant pressure is= Golgi tendon organ
- Tendon struck with hammer. What happens= Excite nuclear bag at end of muscle spindle
- In patellar reflex, which receptors are involved= Muscle spindle
- Receptors in muscles which prevent their length to go beyond limits are= Muscle spindles
- Muscle spindle primarily will detect= Muscle length change
- Response to CNS about muscle stretch to detect changes in= Muscle spindle
- A patient has CVA now has zero power in muscles. Which of the sensory receptors are not functioning in this patient= Golgi tendons
    - It is also asked as
        - In a stroke pt with no muscle power, which sensory receptors function has been compromised= Golgi tendons

282. FLEXOR TENDON REFLEX IS MEDIATED BY= NUCLEAR BAG

REMEMBER THESE POINTS ABOUT STRETCH AND FLEXOR REFLEXES

- Flexor reflex occurs due to= Noxious stimulus
- A flexion reflex is mostly the result of= Noxious stimulation
- A boy walking barefoot gets pricked by a pointed object lying on the ground. He immediately withdraws his leg. Which of the following is involved in flexor withdrawal reflex due to pain= Free nerve ending
- Tendon struck with hammer. What happens= Excite nuclear bag at end of muscle spindle
- Muscle shortening in response to stretch is= Predominantly flexors
- A young medical student already holding 3 books want to pick up a fourth book from the library. Upon holding the fourth book, she drops all the book. This is most likely due to=Inverse stretch reflex

- During Voluntary muscle contraction=Both alpha and gamma motor neuron in descending pathway are excited

NOW THE DIFFERENCE

- Stretch muscle will cause contraction of= Muscle which is stretched
- Muscle shortening in response to stretch is=Predominantly flexors

IN TABES DORSALIS WHAT HAPPENS TO THE BLADDER= ATONIC BLADDER

EMEMBER THESE IMPORTANT POINTS ABOUT INJURY TO BLADDER:

- Tabes dorsalis = Atonic bladder
- Neurogenic bladder= spastic + atonic bladder
- Lesion above sacral segments ----sympathetic damage---= Neurogenic bladder/spastic bladder
- Lesion Below or at sacral segments ----parasympathetic damage---= autonomous bladder

OW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Injury to sacral segments of spinal cord cause=Autonomous bladder causing continuous dribbling
- What will the effect be when the parasympathetic supply to bladder is affected= Autonomous bladder
- After RTA, pt presents with spinal cord injury. Findings will be= Spastic paralysis
- Injury above sacral spinal segment causes which of the following=Neurogenic
- The urinary bladder dysfunction due to renal lesion caused by tabes dorsalis would lead to=Atonic urinary bladder

B/L RECURRENT LARYNGEAL NERVE CUT. MUSCLE SPARED. = CRICOTHYROID.

or this and nerve supply of larynx muscles remember

- Motor nerve: (larnyX is supplied by X cranial nerve (vagus via nucleus ambiguus, laryngeal nerves are branches of vagus nerve) ------Mnemonic: —SCAR----
    - Superior laryngeal nerve →Cricothyroid:
    - All other muscles (except cricothyroid)→Recurrent laryngeal nerve
- Sensory nerve:
    - Above vocal cords: Internal laryngeal nerve (branch of superior laryngeal nerve)
    - Below vocal cords: recurrent laryngeal nerve

OW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Bilateral recurrent laryngeal nerve damaged, Muscle that is spared= Cricothyroid
- An old age pt presents with hoarseness of voice and paralysis of one vocal cord with loss of gag reflex. Lesion is in= Vagus nerve
- Patient after post thyroidectomy developed hoarseness of voice, Examination reveal tense vocal cords. Which of the following is most likely damaged= Thyroarytenoids
    - In some paper thyroarytenoid option was not present prefer post cricoarytenoid then
- Partial resection of both recurrent laryngeal nerves occurred. What will happen to vocal cords= In intermediate position
- A Pt developed Hoarseness of voice. On indirect Laryngoscopy, sluggish movement of left vocal cord was noticed. Injury to which nerve= Left Recurrent L
    - Note: Injury to the recurrent laryngeal nerves can result in a weakened voice (hoarseness) or loss of voice (aphonia)
- Nerve immediately lateral to trachea is= Recurrent Laryngeal nerve
- A 50 year old patient presented with hoarseness of voice. On examination he had left vocal cord palsy. His chest X-ray showed some abnormality. The most likely structure causing compression is= Mediastinal lymph node on left side involving recurrent laryngeal nerve

- Phonation occurs in larynx when= Vocal cords are adducted
- During the pharyngeal stage of swallowing, the= Vocal cords of the larynx are adducted
    - It also comes as
        - During the pharyngeal stage of swallowing the characteristic feature is= vocal cords are strongly approximated
        - During the pharyngeal stage of swallowing= Larynx moves up and forward

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285. PATIENT POST THYROIDECTOMY. HOARSENESS OF VOICE. LOOSENING OF VOCAL CORDS. DAMAGE TO= CRICOTHYROID

REMEMBER

- Posterior Cricoarytenoid: Abduction (opens vocal cords)
- Thyroarytenoid: Relaxation, shortening, adduction (lowers pitch, bowing)
- Cricothyroid: Tensing, elongation (raises pitch)
- Lateral Cricoarytenoid: Adduction (closes vocal cords)

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Two days after performing at a medical school event, a boy presents with hoarseness of voice. Direct laryngoscopy shows *bowing of vocal cords during adduction*. Which muscle is likely involved= Thyroarytenoid
- A boy was screaming in the classroom and the teacher got irritated and asked him to lower pitch of voice. Muscle responsible for high pitched voice is which of the following= Cricothyroid
- Abductor of vocal cord is= Posterior cricoarytenoid
- A student was screaming at high pitch. The teacher asked him to lower his pitch. What is to be used to lower hist pitch= Thyroarytenoid

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286. DURING THYROIDECTOMY SUPERIOR THYROID ARTERY IS LIGATED CLOSE TO GLAND TO SAVE= EXTERNAL LARYNGEAL NERVE

REMEMBER FEW IMPORTANT AND HIGHLY REPEATED POINTS OF THYROID

General considerations	○ Isthmus of thyroid gland=2nd, 3rd and 4th tracheal rings ○ The gland lies against vertebrae C5, C6, C7 and T1 ○ The thyroid gland is enclosed in pretracheal fascia (Thyroid moves on swallowing because of = Pretracheal fascia)
Thyroidectomy	❖ Thyroid surgery upper lobe damages= external laryngeal ❖ Thyroid surgery lower lobe damages= recurrent laryngeal ❖ Most common nerve injured: external laryngeal nerve
Nerve and artery relation	○ Superior thyroid artery is related to: external laryngeal nerve which supplies posterior cricothyroid muscle of larynx. Injured during Thyroidectomy ○ Inferior thyroid artery related to recurrent laryngeal nerve which runs b/w trachea and esophagus and its most common injury is in Tracheostomy (done at 2nd tracheal ring by pulling the isthmus inferiorly) ○ Internal laryngeal nerve passes through= thyroid and hyoid
Embryology	○ Thyroid gland is derived from: endoderm. ○ Thymus and inferior parathyroid develops from: 3rd branchial pouch. ○ Superior para thyroid is developed from: 4th brachial pouch
Drainage	○ Thyroid gland lymph drainage = deep cervical lymph nodes ○ Inferior thyroid veins drain into= brachiocephalic vein ○ Superior and middle thyroid vein drains into= internal jugular vein

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Landmark of thyroid gland is at the level of=C5 to T1
- In partial thyroidectomy posterior thyroidectomy done carefully because to preserve= parathyroid gland
- The most commonly injured nerve during thyroidectomy is= External laryngeal nerve
- Hoarseness of voice occurs due to damage to= Recurrent laryngeal nerve
- Superior laryngeal nerve passes= Between hyoid & upper border of thyroid cartilage
- Superior laryngeal artery and internal laryngeal nerve passes between= thyroid and hyoid
- Nerve supply of trachea is by= Recurrent laryngeal nerve
- Isthmus of thyroid at level of= 2,3,4 tracheal ring
- 10 days after thyroidectomy had done, pt presented with spasm complain. Diagnosis=Hypocalcemic tetany
- The posterior side of thyroid is spared in thyroid surgery to spare which of the following organs=Parathyroid gland
- During tracheostomy, increased bleeding is due to injury to=Anterior jugular vein
- Structure which is medial to Thyroid gland=Recurrent laryngeal nerve
- Surgeon operated lady for enlarged thyroid ligated the superior and inferior thyroid arteries as close to pole as possible. After 2 weeks, she presents with persisting hoarseness. Most likely cause could be injury to=Recurrent laryngeal nerve
- Supply of blood to parathyroid? = Superior and inferior thyroid artery
- The location of the superior parathyroid gland in relation to the inferior thyroid artery and recurrent laryngeal nerve is? = Gland is posterior to RLN and cranial to inferior thyroid artery
- Recurrent laryngeal arises from which pharyngeal arch= 6th
    - Also remember that Superior Laryngeal nerve.is from 4th arch

KNOW THE DIFFERENCE.

- Surgery of LOWER POLE of Thyroid may damage which nerve will be damaged during ligation of inf. Thyroid artery= Recurrent laryngeal nerve
- Which nerve is most likely to be injured during surgery of UPPER LOBE of Thyroid= External Laryngeal
- During thyroid surgery and ligation of inferior thyroid artery nerve most susceptible to injury is= Recurrent Laryngeal
    - It also comes this way
        - Which nerve is most likely to be injured during surgery of lower pole of Thyroid= Recurrent Laryngeal nerve
        - Thyroidectomy was done in left lower lobe. Artery was ligated which supply this area. Which nerve have more chances to be damaged during the operation= Recurrent laryngeal nerve
        - Inferior lobe of thyroid in association with= Recurrent laryngeal
        - During Thyroidectomy, inferior artery ligated. Most likely nerve to get damaged= Recurrent laryngeal nerve

KNOW THE DIFFERENCE

- Which of the following nerve accompany Superior laryngeal artery= Internal laryngeal nerve
    - Remember for--- Superior Thyroid Artery =External Laryngeal N

PRETRACHEAL FASCIA

- Thyroid is invested in= Pretracheal fascia
- Thyroid moves with deglutition as are enclosed in= Pretracheal fascia
    - Also remember that
        - Infection in deep investing layers and Pretracheal layer will spread to= Anterior mediastinum
        - Swelling on neck which moves with swallowing. Infection is in= Pretracheal fascia

THYROID LYMPH DRAINAGE = DEEP CERVICAL LYMPH NODES

NOTE THAT.

- Inferior thyroid veins drain into= brachiocephalic vein
- Superior and middle thyroid vein drains into= internal jugular vein

288. KNEE REFLEX ROOT VALUE= L3, L4

REMEMBER THIS BY THE FOLLOWINGR HYME

- Achilles reflex = S1, S2 ("buckle my shoe")
- Patellar/knee reflex = L3, L4 ("kick the door")
- Biceps and brachioradialis reflexes = C5, C6 ("pick-up sticks")
- Triceps reflex = C7, C8 ("lay them straight")
- Cremasteric reflex = L1, L2 ("testicles move")

ALSO REMEMBER THIS (DISC LEVEL HERNIATION---NOT ROOT VALUE)

- L4–L5 Weakness of dorsiflexion, difficulty in heel walking
- L5–S1 Weakness of plantar flexion, difficulty in toe walking, ↓Achilles reflex

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- S1 nerve compress=Loss of ankle reflex
- A woman developed sciatic nerve compression at L4, L5 what will happen= Weakness of dorsiflexors
- Lumbar pain with loss of ankle jerk/weak ankle jerk. Which is involved=S1
- Nerve supply of knee jerk= L3 and L4
- Person picked heavy weight then developed posterior thigh pain, loss of ankle reflex and loss of sensation on lateral side of foot. Diagnosis= S1
- A patient had a fall. Lateral side of foot sensation lost. Ankle reflex lost. Flexor hallucis nerve lost.= S1
- Young Pt with pain in lower lumbar region radiating to the back of the leg with history of heavy weight lifting on exam straight leg test was restricted at 30 degrees and there was loss of sensation in the leg and loss of ankle jerk nerve compressed is= First sacral nerve
- Receptors involved in for Flexor Reflex= Nociceptors
- The receptors involved in withdrawal reflex are= Nociceptors
- Brain stem not functioning. Which function is still spared= Withdrawal reflex
- Polysynaptic reflex arc= Cremasteric reflex
- In reflex arc, which part of the brain is involved=Cerebral cortex
- A patient was diagnosed as case of cord compression. His Lower Limb reflexes, Ankle, Knee (Patellar) reflex was exaggerated but his bicep tendon reflex is absent, where the compression is= C5-C6

REMEMBER ABOUT KNEE JERK (IT COMES WITH DIFFERENT OPTIONS IN DIFFERENT PAPERS)

- Knee jerk is an example of= Monosynaptic reflex
- Knee jerk is an example of= Involuntary reflex
- Knee jerk is an example of= Myotatic reflex
- Policeman got shot and lost knee jerk reflex where will be the lesion= L4

289. INTERNAL JUGULAR + SUBCLAVIAN JOIN TO FORM= BRACHIOCEPHALIC

REMEMBER:

- Retromandibular joins which vein to form external jugular= Posterior auricular
- Retromandibular vein formed by the union of the superficial temporal and=Maxillary vein
- The portal vein is usually formed by the confluence of the superior mesenteric and= splenic veins
    - It also comes as
        - Superior mesenteric vein and splenic vein join to form portal vein at which anatomical level= Behind neck of pancreas
- Regarding internal jugular vein= Starts from Ear lobule to Sternoclavicular Joint

- Brachiocephalic trunk is formed by union of=Internal jugular and Subclavian vein
- Brachiocephalic vein is formed by= Subclavian and internal jugular vein
- Brachiocephalic trunk gives rise to= Rt. common carotid artery and subclavian artery
- Inferior thyroid veins drain into= brachiocephalic vein
- Axillary vein is formed by= Basilic vein and vena comitantes of brachial vein

290. MOST IMMEDIATE ANTERIOR RELATION TO INTERNAL JUGULAR VEIN AFTER IT EXIT JUGULAR FORAMEN OF SKULL IS= INTERNAL CAROTID ARTERY

KNOW THE DIFFERENCE.

- Internal jugular vein after emerging through jugular foramen has its immediate anterior relation to which of the following= Internal carotid artery
- Internal jugular vein in jugular foramen, immediately anterior is= accessory nerve
    - Inside Jugular Foramen Most Immediate would be=Accessory Nerve.
    - After Exiting the Jugular Foramen Most Immediate Anteriorly Would be= ICA

ALSO NOTE THESE TWO MCQS

- Patient has lipoma on posterior aspect of Sternocleidomastoid muscle, 5cm relation to sternoclavicular joint, during excision troublesome bleeding start due to= 2nd part of subclavian artery
- Tumor compressing anterior surface of sternocleidomastoid. Which vessel will be engorged= External jugular vein
    - If Asked Anterior- EJV
    - If Asked Posterior- Subclavian

291. FASCIA ENCLOSING MASSETER MUSCLE =DEEP CERVICAL FASCIA

ALSO NOTE THAT

- Axillary Fascia derived from= Prevertebral fascia
- Prevertebral fascia encloses which of the following=Dorsal muscle of cervical vertebrae
- Perinephric fat and kidney is enclosed by= gerotas fascia
- Trauma to one kidney without the perforation of Gerota fascia, the blood goes to=Inferiorly to the pelvis
- Thyroid gland moves with swallowing because it is enclosed in = Pretracheal fascia
- Superficial fascia of the scalp is mixture of=Loose areolar and adipose tissue
- Prevertebral fascia abscess drains into=Superior mediastinum
- Infection posterior to prevertebral fascia likely spreads to=Superior mediastinum
- The axillary sheath is a continuation of=Prevertebral fascia
- Clavipectoral fascia which vein is present=Cephalic
- Axillary Fascia derived from=Prevertebral fascia
- True regarding the posterior triangle of neck is=Roof formed by investing layer of deep cervical fascia
- Regarding kidney, which is true=Enclosed with respective supra renal gland in same fascia
- Regarding Carotid sheath relations= Continues inferiorly to merge with adventitia of aortic arch

292. ABSCESS ANTERIOR TO PRETRACHEAL FASCIA INFECTION CAN SPREAD TO = ANTERIOR MEDIASTINUM

REMEMBER:

- Infection outside Pretracheal layer goes to= anterior mediastinum
- Infection of prevertebral fascia can spread to= superior mediastinum
- The thyroid gland is enclosed in= Pretracheal fascia
- Thyroid moves on swallowing because of = Pretracheal fascia

POSTERIOR TRIANGLE OF THE NECK IS DIVIDED INTO TWO PARTS BY= INFERIOR BELLY OF OMOHYOID

TRIANGLES OF NECK

Anterior Triangle	❖ Boundaries: ○ Anteriorly: middle line of neck ○ Posteriorly: anterior border of sternocleidomastoid muscle ○ Superiorly: lower border of mandible Further subdivisions ○ Carotid triangle (between SCM, Post belly of digastric, sup belly of omohyoid) ○ Submental triangle (hyoid bone, Rt and LT bellies of digastric) ○ Digastric (submandibular triangle) ----Inf edge of mandible & ant and post belly of digastric ○ Muscular triangle (Midline of neck, SCM, sup belly of omohyoid)
Posterior Triangle	❖ Boundaries: ○ Anteriorly: posterior border of sternocleidomastoid ○ Posteriorly: anterior border of trapezius ○ Inferiorly: middle 1/3rd of clavicle ❖ Contents: ○ Subclavian artery (3rd part) and subclavian vein ○ External jugular vein ○ Brachial plexus ○ Branches of cervical plexus ○ Spinal part of accessory nerve

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

POSTERIOR TRIANGLE OF NECK

- Nerve damaged in post triangle=Accessory nerve
- Injury in the posterior triangle of neck damages which structure=Spinal part of accessory nerve
- A patient was operated for an abscess in the posterior triangle of neck. Post-surgery, she now complains that she can't comb her hair. Most likely the lesion is in=Spinal accessory nerve
- Boundaries of Posterior triangle of the neck= Covered by investing layer of deep cervical fascia
- True regarding the posterior triangle of neck is= Roof formed by investing layer of deep cervical fascia
- Short neck, stab wound causes paralysis in posterior triangle. Muscle damaged= Trapezius
- Posterior triangle of Neck is divided by=Inferior belly of omohyoid

SUBOCCIPITAL TRIANGLE

- Which artery passes in the floor of sub occipital triangle=Vertebral artery
- Trauma to floor of sub occipital triangle will cause damage to which artery=Vertebral artery

ACTION OF MUSCLES

- Function of Geniohyoid is= Elevate hyoid or depress mandible
- Action of sternocleidomastoid= Movement of neck in opposite direction against resistance
- Posterior triangle of the neck is divided into two parts by= Inferior Belly of omohyoid

ABOUT LUMBAR TRIANGLE

- Posterior border of the lumbar triangle is formed by=Latissimus dorsi
- Anterior boundary of lumbar triangle is formed by=By Posterior border of External oblique muscle.
  - It also comes as
    - Lumbar triangle is anteriorly related to posterior part of which structure=External oblique

OTHERS

- Muscle for demarcation of neck= Scalene anterior (Remember preferring Sternocleidomastoid muscle if in options)

- Anatomical landmark of neck muscle is=Scalenus anterior (Remember preferring Sternocleidomastoid muscle if in options)
- Landmark muscle used to pass CVP line=Sternocleidomastoid
- Between sternocleidomastoid, posterior belly of digastric and superior belly of Omohyoid which triangle= Carotid
- Submandibular gland lies between=Btw digastric anterior belly and mandible
- Boundaries of submandibular gland= Between bellies of digastric and mandible
- Structure which separates superficial and deep part of submandibular gland= Mylohyoid
- A newborn was intubated for resuscitation O/E breath sounds absent on Rt side of chest. What is the cause of endobronchial intubation is= Short neck
- Appropriate function of sternocleidomastoid=Turns the neck to opposite side against resistance

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294. SURGERY IN THE POST TRIANGLE OF NECK CAN CAUSE DAMAGE TO WHICH STRUCTURE= SPINAL PART OF ACCESSORY NERVE

REMEMBER THESE IMPORTANT POINTS (MCQ'S) ABOUT ACCESSORY NERVE

- Surgery in the post triangle of neck can cause damage to which structure= Spinal part of Accessory nerve
- Most immediate anterior relation to internal jugular vein after it exit jugular foramen of skull is= internal carotid artery
- Spinal roots of accessory nerve= Passes in the substance of SCM
- Person can't shrug his shoulder and has ptosis, meiosis. Nerve involved= Accessory nerve and sympathetic chain

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295. UNABLE TO OPEN MOUTH WHICH MUSCLE PARALYZED = LATERAL PTERYGOID

REMEMBER IT BY MNEMONIC.

- While you say L– your mouth opens – Lateral pterygoid OPENS mouth
- While you say M—your mouth closes—Medial pterygoid CLOSES mouth
- The masseter elevates the jaw which closes the mouth. The **temporalis** elevates and retracts the jaw
- Also remember when asked Protrusion of mandible is by= Lateral pterygoid
- Muscle that gets Paralyzed/damaged in temporomandibular joint dislocation= Lateral pterygoid

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

LATERAL PTERYGOID

- A 64-year-old woman is unable to open her mouth or jaw because of tetanus resulting from a penetrating wound from a rusty nail. Which of the following muscles would most likely be paralyzed=Lateral pterygoid muscle
- In TMJ dislocation, which structure prevents the joint to go back in cavity= Lateral pterygoid muscle
- Temporomandibular Joint dislocation will lead to which muscle paralysis= Lateral Pterygoid
- Excessive yawning, which muscle= Lateral pterygoid
- Which of the following muscle of mastication is attached to the neck of mandible and capsule of joint= Lateral pterygoid
- Which of the following muscles provide forward traction during opening of mouth= Lower fibers of lateral pterygoid
- Which muscle partially intersect TMJ joint= Lateral pterygoid

MASSETER AND MEDIAL PTERYGOID

- The muscle that closes the jaw is= Masseter
- Muscle which closes the mouth = Medial pterygoid

TEMPOROMANDIBULAR JOINT

- Most common site of mandible dislocation is= Anterior

- ❖ Most common dislocation of TMJ = Anterior (TM-Joint can dislocate only anteriorly)
- ❖ Proprioception's of TMJ, Muscle of mastication's and teeth, hard palate and periodontium are perceived by= Mesencephalic nucleus of trigeminal Nerve
- ❖ Disc of TMJ attaches to condyle of mandible by which ligament= Collateral ligaments

KNOW THE DIFFERENCE

- ❖ What helps to stabilize TMJ in cavity= Capsule
- ❖ Which ligament gives stability and keeps TMJ in position=Temporomandibular ligament

OTHERS

- ❖ Posterior fibers of temporalis contraction causes= Retraction of mandible
- ❖ Patient presented with pain while chewing. The Muscle is also tender on palpation, muscle involved is=Masseter
- ❖ Parotid swelling pain though= Compression of Auriculotemporal nerve
- ❖ The superficial temporal artery is accompanied by one of the following nerves= Auriculotemporal nerve
- ❖ After trauma to mandible, lower teeth and chin sensation are lost. Which nerve is compromised= Inferior alveolar nerve
- ❖ Boxer got trauma on mandible. What will happen= Loss of sensation of lower teeth and gum

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296. THE GLENOID FOSSA IS A PORTION OF WHICH BONE=SCAPULA

LSO NOTE THAT

- ✓ While Mandibular fossa, the depression in the = temporal bone
- ✓ A mass in Infratemporal fossa has started eroding floor of middle cranial fossa. Which structure is likely to be involved=Greater wing of sphenoid
- R ✓ A Tumor in the Infratemporal fossa invades the middle cranial fossa. Which bone will it have to cross=Greater wing of sphenoid R
- ✓ Pituitary adenoma invades which bone=Sphenoid Bone
- ✓ A Pt feels a swelling in the supraclavicular fossa whenever he coughs. He gives Hx that he was shot in the neck some years back. Most likely lesion is in=Suprapleural membrane
- ✓ True about trigeminal ganglion=Lies in apex of petrous part of temporal bone in middle cranial fossa

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297. SPINAL CORD ENDS AT = LOWER BORDER OF L1

REGARDING SPINAL CORD TERMINATION

- ❖ L1 in adults
- ❖ L3 in New-born (upper border).
- ❖ Conus medularis (it is spinal cord termination tapered at lower end) → L3 in children, L1 in adults
- ❖ Coccygeal ligament is formed by joining of dura, pia and arachnoid at the level of= S2,
- ❖ Subarachnoid space ends at the level of= S2 S3

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- ❖ Site of Lumber puncture= Below L4
    - o "Kaplan" and First aid Says L4-L5 while other 3 sources including Davidson says L3-L4 is most common site. I am with L4-L5, even though L3-L4 is also right.
- ❖ Ideal site for LP= Above L5
- ❖ Spinal cord at L4 level, absent structure= Lateral horn
- ❖ Spinal cord termination in childrens at level of=L3
- ❖ Spinal cord termination in adults at level of=L1
- ❖ Spinal anesthesia is given below=L2
- ❖ Subarachnoid space ends at the level of=S2-S3
    - o It also comes as

- Lower limit of subarachnoid space extension into= Coccygeal Ligament (Ref: Essential Neuroscience by Allan Siegel Page 37)
- Last end of spinal cord surrounded by dura pia arachnoid end at the level of=S2
- Regarding Cauda equina=Anterior and posterior roots of spinal cord from L1-L5
- Regarding pia mater=Extends into sulci and fissures of brain tissue

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A PATIENT DEVELOPS SENSORY LOSS OVER LEFT SIDE OF BODY. AFTER FEW DAYS HIS BEHAVIOR FOR PAIN IS CHANGED & HE BECOME ANGRY AFTER TOUCHING. WHERE COULD BE THE LESION IN BRAIN= RIGHT THALAMUS

OTE THE FOLLOWING MCQ'S:

- Right upper and lower limb paralysis+ RIGHT SIDE face paralysis damage is in= internal capsule
  - Hint: uncrossed lesion = UMN lesion= internal capsule
- Right upper and lower limb paralysis+ LEFT SIDE face paralysis damage is in= pons
  - Hint: crossed Hemiplegia = LMNL= Pons
- Pt with right hemiplegia and deviation of mouth to left and drooling of water on swallowing. Lesion is at= Left internal capsule
  - Hint: left deviated mouth→ weak RT facial muscles and unopposed left facial muscles
- Sensory loss on left side face n left side body. Level of lesion= Thalamus
  - Hint: Sensory loss= thalamus
- 59 yrs old hypertensive pt presented in Emergency in comma with left side hemiplegia n bilateral pinpoint pupils, lesion in= pons
  - Hint: bilateral pinpoint pupils →think of Pons
- Weakness on right and diplopia on seeing left lesion in= Midbrain
- Patient presents with paralysed right arm and leg, right plantar up going and exaggerated reflexes lesion= left internal capsule

NOW THE DIFFERENCE

- A patient with restricted movement on lateral side of left eye, unable to close left eye and hearing loss in the left ear. The lesion is in=Cerebropontine angle
- Patient with intentional tremors and facial paralysis lesion at =Cerebellopontine angle

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PATIENTS COMES WITH RT. DEVIATION OF TONGUE, DEC. SENSE OF TOUCH AND VIBRATIONS, THE ARTERY COMMONLY INVOLVED IN BRAIN IS = ANT. SPINAL ARTERY

OTE THE EFFECT OF STROKES IN RELATION TO ARTERY

Artery	Features
Middle cerebral artery	❖ Contralateral paralysis and sensory loss ❖ Contralateral homonomous heminopia ❖ Aphasia o Temporal lobe (Wernicke area) o Frontal lobe (Broca area).
Anterior cerebral artery	❖ Contralateral paralysis and sensory loss
Anterior spinal artery	❖ Contralateral paralysis ↓contralateral proprioception. ❖ Ipsilateral hypoglossal dysfunction →tongue deviates ipsilaterally ❖ e.g. on right side artery lesion → tongue deviated towards right
Posterior inferior cerebellar artery	❖ Lateral medullary syndrome (aka Wallenberg syndrome, posterior inferior cerebellar artery syndrome "PICA") o Ipsilateral→ Ataxia, nystagmus o Ipsilateral→ facial pain and temperature loss o Contralateral→ pain and temperature loss ❖ Dysphagia, hoarseness, ↓gag reflex, Vomiting, vertigo, nystagmus

	❖ Ipsilateral Horner syndrome
Anterior inferior cerebellar artery	❖ Lateral pontine syndrome ○ Ipsilateral → Ataxia, nystagmus ○ Ipsilateral → facial paralysis (↓ lacrimation, ↓ salivation, ↓ taste from anterior 2/3rd of tongue) and deafness ○ Contralateral → pain and temperature loss ❖ Ipsilateral Horner syndrome
Posterior cerebral artery	❖ Contralateral hemianopia with macular sparing
Retinal/ophthalmic artery	❖ Amaurosis fugax (painless temporary loss of vision in one or both eyes)

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

MIDDLE CEREBRAL ARTERY (MCA)

- ❖ Aphasia results from damage in → temporal lobe (As written above also it results from frontal lobe– Need to know which aphasia either Wernicke or Broca's)
- ❖ A patient has aphasia & facial nerve palsy on the same side. Which artery is most likely blocked? = Middle cerebral artery
- ❖ A patient presented with paralysis of leg and aphasia. Artery likely damaged? = MCA
- ❖ Hemiparesis with facial nerve palsy. Lesion in which artery? = MCA
- ❖ One of the following arteries supplies Broca's area and adjacent cortico-spinal tract? = Middle cerebral
- ❖ The middle cerebral artery is the largest and most direct branch of the internal carotid; it most likely supplies? = Cortex of insula and overlying opercula
- ❖ Which of the following is a branch of the middle cerebral artery? = Rolandic artery
- ❖ A patient with thrombosis in a branch of the internal carotid artery most likely involves? = Middle cerebral artery

ANTERIOR CEREBRAL ARTERY (ACA)

- ❖ The medial part of the frontal and parietal lobe is supplied by? = Anterior cerebral artery
- ❖ Blood supply to the cingulate gyrus? = Anterior cerebral artery
- ❖ A person has paralysis of the left leg and also an inability to recognize objects. The artery involved is? = Anterior cerebral
- ❖ The arterial supply of the primary motor cortex is by? = Anterior and middle cerebral
- ❖ Premotor area is supplied by? = Anterior and middle cerebral artery

POSTERIOR CEREBRAL ARTERY (PCA)

- ❖ Visual issue. Infarct is present in blood vessel of visual center. Diagnosis? = Posterior cerebral artery
- ❖ A man with trauma to the posterior side of the head and loss of peripheral vision. Artery involved? = Posterior cerebral artery
- ❖ Thalamus is supplied by which artery? = Posterior cerebral artery

ANTERIOR SPINAL ARTERY

- ❖ Tongue deviation to the right side, ↓ sense of touch and vibrations. Artery involved? = Anterior spinal artery
  - o Know the difference
    - ▪ Tongue deviated to same side of nerve injured= hypoglossal nerve
    - ▪ RT deviation of tongue, ↓ sense of touch and vibrations artery involved= ant spinal artery
- ❖ The medial medullary syndrome is due to occlusion of the? = Anterior spinal artery

POSTERIOR INFERIOR CEREBELLAR ARTERY (PICA)

- Posterior inferior cerebellar artery blockage. Part of brain affected= Dorsolateral part of medulla

0. APHASIA (NON-FLUENT) AFTER STROKE OR TRAUMA WHICH AREA OF BRAIN IS INVOLVED = BROCA'S

REMEMBER

- Lesion in dominant Broca's area / inferior frontal lobe→ Motor aphasia
    - Mnemonic: **B**roca's =**B**roken mouth---- Patient can't speak properly but can understand written and spoken language
- Lesion in Wernicke's area / superior temporal lobe→ Sensory aphasia
    - Mnemonic: **W**ernicke is **W**ordy but makes no sense. ---- Patient can speak, but can't understand spoken and written language
- Lesion in non-dominant Broca's area / angular gyrus / arcuate fasciculus → Anomic (conductive) aphasia
- Lesion in both Broca's & Wernicke's area → Global aphasia

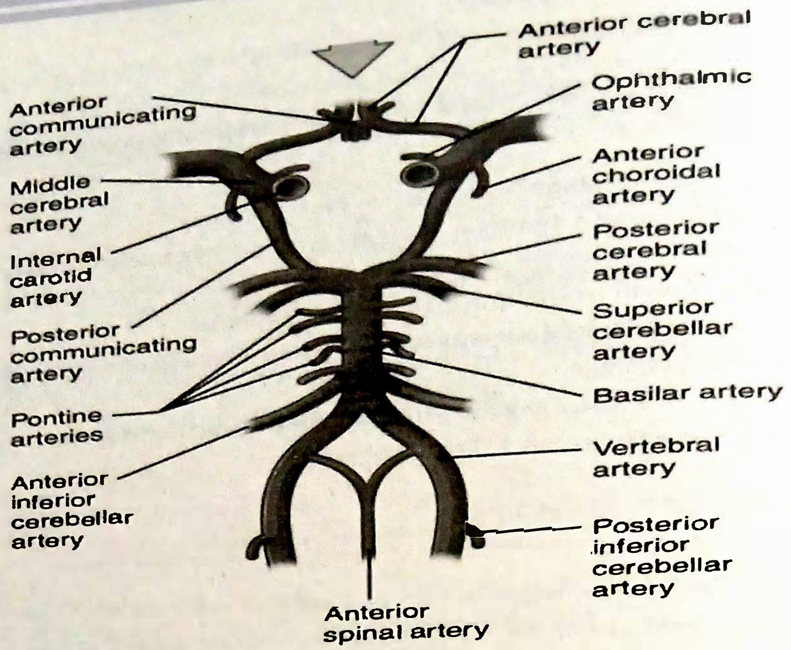
NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Non fluent aphasia (Can't speak) lesion in = Broca's aphasia =, (**B**roca's= **B**roken mouth)
- Fluent aphasia (can speak), Lesion in= Wernicke aphasia= (**W**ernicke=**W**ordy)
- A question asked about aphasia in scenario both the sensory and motor aphasia were given and asked which type of aphasia is that= Global Aphasia
- A person with both Broca's and Wernicke's aphasia= Global aphasia
- Broca area damage which aphasia= Motor
- Patient had RTA and spoke fluently but with not much sense= Wernicke aphasia
- Conduction aphasia is a result of damage of= Arcuate fasciculus
- Lesion in angular gyrus leads to = Anomic Aphasia
- Aphasia occurs mostly due to involvement of= Temporal
- Which area is commonly involved in causing aphasia= Superior temporal region
- Broca's aphasia occurs due to blockage of=MCA
- Conductive aphasia artery involved is=MCA
- Non fluent aphasia associated with damage to=Broca's area
- Changes in motor aphasia are often associated with a lesion of=Broca's area
- Anomic aphasia occurs due to lesion in=Angular gyrus > Broca area of non-dominant hemisphere
- Broca's area damaged in non-dominant left cerebral hemisphere results in which aphasia=Anomic
- Broca's area is located in=Inferior frontal gyrus

1. POSTERIOR COMMUNICATING ARTERY= PASSES ABOVE THE OCCULOMOTOR & CONNECTS ICA (INTERNAL CAROTID ARTERY) AND PCA (POSTERIOR CEREBRAL ARTERY)

KNOW ABOUT CIRCLE OF WILLIS

- Lies in subarachnoid space of brain
- Formed by anastomosis between two internal carotid arteries and two vertebral arteries
- Anterior communication:
    - Internal carotid and anterior cerebral artery (both are branches of ICA)
- Posterior communication:
    - Posterior cerebral and basilar artery. (both are the branches of vertebral arteries)


Anterior cerebral artery
Ophthalmic artery
Anterior choroidal artery
Posterior cerebral artery
Superior cerebellar artery
Basilar artery
Vertebral artery
Posterior inferior cerebellar artery
Anterior spinal artery
Anterior communicating artery
Middle cerebral artery
Internal carotid artery
Posterior communicating artery
Pontine arteries
Anterior inferior cerebellar artery

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- ❖ Bitemporal hemianopia aneurism is at= Anterior communicating artery
- ❖ Post. Communicating artery connect = basilar to internal carotid artery
- ❖ Vertebral artery divides into= Posterior cerebral arteries
    - o Here this was the only closes option in previous MCQs
    - o Vertebral artery unites to form basilar artery—which then divides into the right and left posterior cerebral arteries
    - o So just make your concept via this—and choose the right option there
- ❖ Basilar artery divides into= Two posterior cerebral artery
- ❖ Basilar artery ends by dividing into? = Posterior cerebral arteries
- ❖ Which of the following take part in Circle of Willis= Anterior and Posterior communicating
- ❖ The posterior communicating artery of the brain (circle of Willis)? = Runs under the oculomotor nerve & joins internal carotid artery with posterior cerebral artery
- ❖ The most likely place in brain where major blood vessels are found is= Subarachnoid space
    - Note the difference between subarachnoid space & arachnoid mater, the arachnoid matter is avascular

302. INJURY TO LATERAL HYPOTHALAMUS WILL = DECREASES HUNGER

NOTE ABOUT HYPOTHALAMIC NUCLEI

Area	Function	Notes
Lateral Area	Stimulates Hunger---	Stimulated by Ghrelin (Gains appetite) Inhibited by Leptin (Lowers appetite) Destruction leads to anorexia
Ventromedial Nucleus	Inhibits appetite Satiety center	VIP – (Ventromedial Inhibits Appetite) Craniopharyngioma → Destruction occurs in leading to Hyperphagia.
Anterior Hypothalamus	Cooling, parasympathetic.	A/C → Anterior is for Cooling
Posterior Hypothalamus	Heating, sympathetic.	
Suprachiasmatic Nucleus	Circadian rhythm.	You need sleep to be charismatic (chiasmatic).
Supraoptic Nuclei	Synthesize ADH	

Paraventricular Nuclei	Synthesizes oxytocin	

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- ❖ ADH is primarily formed by=Supraoptic nuclei
- ❖ Satiety center located in which part of hypothalamus= Ventromedial
- ❖ Damage to lateral hypothalamus= Loss of appetite
- ❖ Causing cooling of body= Preoptic area of hypothalamus
- ❖ Activation of posterior hypothalamus would cause= Shivering
- ❖ Heat conservation is carried out by= Posterior hypothalamus
- ❖ Function of anterior hypothalamus= Temperature control
- ❖ Temperature increase above set point. What will decrease= Sweating
- ❖ Temperature regulation is controlled by= Anterior hypothalamus
  - o Or it also come as "Body temperature compared with temperature control set point, which area of brain involved= Anterior hypothalamus"
  - o But also remember
    - ▪ Cytokines elevate body temperature in fever by= Stimulating Prostaglandin
    - ▪ Fever in inflammation is caused by= IL-1
    - ▪ A boy standing in hot sunny day heat loss is by= Cutaneous hyperemia
- ❖ Evaporative and non-evaporative heat conduction is controlled by= Continuously monitored through Hypothalamus
- ❖ A pt has problem of anosmia and hypogonadism, which of following region of the brain will be having lesion on MRI= Hypothalamus
  - o Note this is a scenario of Kallmann syndrome
- ❖ A female presented with decreased eating habits and loss of weight. CT brain shows lesion in hypothalamus. Which area is mostly affected= Lateral hypothalamus
- ❖ Beta endorphin present in= Hypothalamus
- ❖ Which of the following pituitary hormones is an opioid peptide= β-Endorphin
- ❖ Inhibitory factor released by hypothalamus against which one of the following= Prolactin
- ❖ What decreases appetite= Leptin
- ❖ Which of the following hormone exhibits a relation between weight and puberty=Leptin
- ❖ In addition to blindness, a lesion that destroys the optic chiasma and the immediately related overlying part of the hypothalamus would most likely cause= Hyperphagia

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303. MEMORY CENTER IS LOCATED IN = TEMPORAL LOBE

PAST PAPER MCQ'S

- ❖ Temporal lobe lesion will affect what= Memory
- ❖ Memory center is located in which part of the brain= Temporal lobe

CPSP USUALLY PLAYS WITH THESE WORDS—QUESTION REMAINS THE SAME

- ❖ Short term Memory loss due to lesion in= hippocampus
- ❖ Short term memory loss due to lesion in= Limbic association area (hippocampus is a part of limbic area--No option of hippocampus in this MCQ was given ---if given remember Para hippocampus > limbic)
- ❖ Loss of long-term memory occurs due to lesion in =Limbic > amygdala
- ❖ Which part of limbic system is involved in emotions= Cingulate gyrus

IT IS ALSO ASKED AS

- ❖ B/L hippocampus damage= Memory loss
- ❖ Structural changes in protein synthesis leads to= Long term memory

- Long term memory is made by=Protein synthesis and gene activation

ALSO NOTE THAT

- Short term Memory loss due to lesion in= hippocampus
- Short term memory loss due to lesion in= Limbic association area (hippocampus is a part of limbic area)
- Cause of retrograde amnesia= Temporal lobe

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304. AN OLD MAN HAS A HISTORY OF STROKE. LATER HE DEVELOPS REDUCED MOTIVATION AND DEPRESSION. HE HAS A LESION IN A= FRONTAL LOBE

REMEMBER

- Frontal lobes lesions
  - Expressive (Broca's) aphasia:
  - Depression and lack of motivation
  - Anosmia
- Temporal lobe lesion
  - Wernicke's aphasia:
  - Prosopagnosia (difficulty recognizing faces)
  - Memory problem
  - Perception of auditory impulses
- Parietal lobe lesions
  - Astereognosis (tactile agnosia)
  - Finger agnosia (difficulty in identifying the fingers and naming them)
  - Agraphia (difficulty in writing),
- Occipital lobe lesions
  - Homonymous hemianopia (with macula sparing)
  - Cortical blindness
  - Visual agnosia

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- After head injury in a car accident, pt developed depression and lack of motivation. This is most likely due to lesion in= Frontal lobe
- Memory center is located in which part of the brain=Temporal lobe
- The commonest site for pyogenic brain abscess is= Frontal lobe
- An arterial occlusion results in impairment of writing and speech. Which area/lobe of the brain has been affected= Frontal lobe
- After stroke patient experiences impairment of writing and speech. Which area/lobe of the brain has been affected= Anterior part of frontal lobe
- Prosopagnosia= Inferior temporal lobe
- Primary auditory cortex lies in= Superior temporal lobe
- Area of sound perception is located in= Cortex in temporal lobe
- From which area of the brain do the majority of cerebral cortex cholinergic fibers originate= Nucleus basalis of Meynert
- Perception of disgust by which area= Left insular cortex
- Prosopagnosia occurs due to lesion in= Parieto-occipito-temporal lobe
- Facial recognition in daily life is done by which of the following parts= Fusiform gyrus of temporal lobe

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305. DORSOMEDIAL NUCLEUS OF THALAMUS RECEIVES SENSATIONS OF= MEMORY

NOTE THE MAIN NUCLEI OF THALAMUS FUNCTIONS

- Remember thalamus is the major relay for all ascending sensory information **except olfaction**.

Nuclei	Function (senses)	Notes

Lateral Geniculate Nucleus	Vision	Lateral = Light
Medial Geniculate Nucleus	Hearing	Medial = Music
Ventral Postero-Lateral Nucleus	Vibration Pain, Pressure, Proprioception, Light touch temperature	
Ventral Postero-Medial Nucleus	Face sensation Taste	Makeup goes on the Face

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- A patient was made to taste quinidine. The taste sensations are carried by= VPM nucleus of thalamus
- Taste sensation from Tractus Solitarius carried to cortex via= Thalamus
- VPL Nucleus of Thalamus injury cause which of the following= Contralateral somatosensory lost
- Thalamic hemorrhage leads to= Hyperesthesia
- Hemiballismus result when damage occurs to which area of the brain= Subthalamic nucleus
- Patient attendant says that in home the patient got a slow rise of both hands overhead and then fall to a side and get unconscious, MRI of the brain will show lesion in which area of brain= Sub thalamic nuclei (**Hemiballismus** scenario)
- Thalamus is a major relay for all ascending sensory information except= Olfaction
  - It also come in this way
    - Research is done on function of thalamus MRI shows different sensory stimuli. Which of following will produce minimal neurological activity in thalamus= Olfactory
    - If thalamus gets damaged, which is not affected = sense of olfaction
  - Also remember
    - Olfactory area is present in = temporal gyrus
    - Location of olfactory cortex is at= Inferior temporal lobe
- A patient develops sensory loss over left side of body. After few days his behavior for pain is changed & he become angry after touching. Where could be the lesion in brain= Right thalamus
  - ✓ (This is the so-called thalamic pain syndrome also known as Dejerine–Roussy syndrome the person becomes sensitive even to normal stimuli).

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306. NUCLEUS AMBIGUS SUPPLIES = LARYNX

- Remember that nucleus ambigus is for 9, 10 and 11 cranial nerve, also remember that parasympathetic (Autonomic) nucleus for vagus is DorsAl motor nucleus

Nuclei	Function	Cranial Nerves
Nucleus Solitarius	Sensory information (e.g., taste, baroreceptors, gut distention)	VII, IX, X
Nucleus aMbiguus	Motor innervation of pharynx, larynx, upper esophagus (e.g., swallowing, palate elevation)	IX, X, XI (cranial portion)
DorsAl motor nucleus	Autonomic (parasympathetic) fibers to heart, lungs, upper GI	X

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- GVE carried in vagus nerve for preganglionic fibers arise from= Dorsal Nucleus
- GVE nucleus of vagus nerve is= Dorsal motor nucleus
  - Note: GVE (general visceral efferent) ---General efferent fibers refers to the efferent neurons of the autonomic nervous system that provide motor innervation to smooth muscle, cardiac muscle, and glands
- Cranial nerves from nucleus ambiguous= CN 9, 10, 11

- Dorsal nucleus of vagus nerve is present at= Medulla
- Nucleus ambiguous lies in= Medulla
    - It also comes in this way:
        - Upper medulla section has which of the following= Nucleus Ambiguous

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307. MOST SENSITIVE CELLS TO HYPOXIA ARE = NEURONS

- Note that when asked most sensitive (**vulnerable**) to ischemic hypoxia than = **Hippo**campus
- Mnemonic= ("**vulnerable hippo** s").

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308. MYELIN IN CNS IS FORMED BY = OLIGODENDROCYTES

ALSO NOTE:

- while myelin in PNS is formed by Schwann cells

ALSO REMEMBER

- At Node of Ranvier= there is Lack of Myelin sheath & Highest Na concentration
- **D**endrites receive stimulus (action potentials) and carry impulses towar**D** the cell body
- While **A**xon – carries impulses **A**way from the cell body
- Axon Hillock = the part of a neuron's cell body that connects to the axon. The axon hillock is the part of the neuron where nerve electrical activity is summated to determine the likelihood of firing an action potential.

ALSO NOTE THAT

- Unipolar neurons------ have only one structure extending from the cell body
- Bipolar neurons ---------have one axon and one dendrite
- Multipolar neurons----- contain one axon and many dendrites

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Myelination in peripheral nerves is caused by= Schwan cells
- Myelination in CNS is done by= Oligodendrocyte
- Myelination of nerve fiber of CNS in intrauterine life begins at= 4 months
- Schwan cells like cell in CNS= Oligodendroglia
- Nissl bodies are absent in= Axon hillock
    - While Nissl bodies are mainly present in= RER
- Regarding axons= Carry impulses away from cell bodies
- Bipolar neuron has how many dendrites= 1
- Antigen presenting cells in skin & thus protecting from pathogens are= Dendrites
    - Also, remember
        - Antigen presenting cells of intestine are= M cells
- Area at nodes of Ranvier has= No myelin
- The area of brain where flask shaped cell bodies are present with multiple parallel dendrites= Cerebellar cortex
- Most of the mitochondria in a neuron are found in= Axon endings
- Action potential is first generated at=Axon hillock
- All or non-action potential occurs at=Axon hillock
- In spinal ganglia, which neurons are present= Pseudo unipolar
- Sensory neurons are=Pseudo unipolar
- Which of following cells are found in white matter of spinal cord=Oligodendrocytes
- Cell causing hindrance to regeneration of CNS= Oligodendrocytes
- Most abundant glial cells in gray matter=Protoplasmic astrocytes

309. **SUBDURAL HEMATOMA DUE TO = LEAKAGE OF CEREBRAL VEIN**

REMEMBER

Epidural hematoma	❖ Rupture of middle meningeal artery (branch of maxillary artery), often 2° to skull fracture. ❖ Lens shaped (biconvex / lentiform) hematoma. ❖ Involving the pterion (thinnest area of the lateral skull)—temporal lobe ❖ Lucid interval ❖ CN III palsy.
Subdural hematoma	❖ Rupture of bridging veins/great cerebral vein/diploic vein ❖ Crescent-shaped hematoma. ❖ Most commonly secondary to trauma e.g. old person/alcohol falling over ❖ Most commonly occur around the frontal and parietal lobes ❖ Risk factors include old age, alcoholism and anticoagulation ❖ Features: ○ Headache ○ Classically fluctuating conscious level ○ Raised ICP
Subarachnoid hemorrhage	❖ Bleeding due to trauma, or rupture of an aneurysm (such as a saccular aneurysm) or arteriovenous malformation. ❖ Patients complain of "worst headache of my life." + Neck stiffness on examination
Intraparenchymal hemorrhage	❖ Most commonly caused by systemic hypertension. ❖ May be 2° to reperfusion injury in ischemic stroke. ❖ Typically occurs in basal ganglia and internal capsule

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Middle meningeal artery is branch of which artery= Maxillary artery.
- Regarding Skull= pterion is the area where branches of middle meningeal lies
- Damage to Middle meningeal artery causes hematoma formation between= Dura Calvaria
- Trauma to Anterior branch of middle meningeal artery, the blood will be present in= Dura Calvaria
- Middle meningeal artery rupture, blood collects in= Epidural
- Damage to temporal region with bat. History of 3 minutes' unconsciousness then headache and blurred vision. Damage is to= Anterior branch of middle meningeal artery
- A person received blow on lateral part of head region. Which artery is likely to be damaged= Middle meningeal artery
- At pterion which branch given= Deep branch of middle meningeal artery
- Regarding Middle meningeal artery= Anterior branch lies deep to pterion
- A boy gets hit with ball on right side of head, he remains unconscious for 3 mins. Later on develops temporal swelling, blurring of vision and dizziness. O/E right pupil dilated. Which Vessel is involved= Anterior branch of middle meningeal artery
- Sub-dural hemorrhage is due to damage to= Superior cerebral vein
- A pt was presented to ER in state of severe headache and vomiting, on LP blood was present in CSF. The most probable diagnosis is= Subarachnoid hemorrhage
  - It also comes as
    - A known HTN lady presented with severe headache (worst headache of life), vomiting and raised ICP. On lumbar puncture, the CSF was blood stained. What is the most likely cause= Subarachnoid hemorrhage
    - Blood-stained CSF is caused by which of the following= Subarachnoid hemorrhage
- Epidural hemorrhage is caused by injury to= Anterior branch of middle meningeal artery
- Epidural or extradural Hemorrhage is caused due to damage to= Middle meningeal artery

- ❖ An unconscious Person presented in Emergency, he had injury to head, he was kept in observation after some time Lucid interval was seen then again patient become unconscious what is the cause= Epidural hematoma
- ❖ Severe headache, rupture of middle meningeal artery with intact meninges. Cause=Epidural hemorrhage
- ❖ Subdural hematoma occurs due to rupture of= Superior cerebral veins
- ❖ Fracture on anterior-inferior of parietal bone with non-blood-stained CSF leads to= Epidural hemorrhage

310. DEEP COMA IS CAUSED BY LESION OF WHICH NUCLEUS = NUCLEUS CERELOUS

- ❖ Deep coma= Nucleus cerelous
- ❖ Prolonged coma= Periaqueductal gray matter (middle lobe)
- ❖ Permanent coma= thalamus.

311. DORSAL COLUMN MEDIAL LEMINSICAL CARRIES = PROPRIOCEPTION

REMEMBER

Tract	Function	Synapse + Projections	Mnemonic
Ascending Tracts			
Dorsal (Posterior) column tract ○ Fasciculus cuneatus (upper body, arms) ○ Fasciculus gracilis (lower body, legs) (remember it as Gracilis muscle in lower legs)	Pressure, vibration, fine touch, proprioception	VPL (thalamus) → sensory cortex	PCT (Posterior Column Tract) does not carry PCT (Pain, Crude touch and Temperature)—which are carried by spinothalamic tract
Lateral spinothalamic tract	Pain, Temperature		PaTeLa bone----Pain, Temperature, Lateral spinothalamic tract
Anterior spinothalamic tract	Crude touch, Crude pressure		AC--- Anterior spinothalamic tract—Crude touch and Crude pressure
Descending Tract			
Lateral and anterior Corticospinal tract	Voluntary motor	NMJ → muscle fibers	

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

SPINOTHALAMIC TRACT

- ❖ Crude touch carried by= Anterior Spinothalamic
- ❖ Pain through free nerve ends is transmit by= Spinothalamic tract
    - ○ Note that Spinothalamic pathways carry pain and temperature from substantia gelatinosa to thalamus—but with free nerve endings mainly spinothalamic tract is associated
- ❖ Patient have excruciating Right leg pain. Right leg cordotomy was performed which tract was involved= left lateral spinothalamic tract
- ❖ Pain and temperature fibers are in=Lateral spinothalamic tract
- ❖ Man, with gunshot wound in spine at L1 has Loss of pain and temp of right Side of lower limb. Which pathway has been damaged= Left lateral spinothalamic
- ❖ A pt. doesn't feel pain on his right side. The most likely lesion is in= Lt Lateral spinothalamic tract

- Left leg pain temp lost which tract affected= Right lateral spinothalamic
- Patient of pancreatic Ca right sided leg pain, his pain was relief by cutting down= left lateral spinothalamic
- Right leg cordotomy done and pain relieved. Cause= Left lateral spinothalamic cut
- Primary afferents from Nociceptors terminate in= Lamina of spinothalamic tract
- Free nerve endings carry pain and temperature in= Lateral spinothalamic tract
- Unmyelinated nociceptive primary afferent fibers synapse directly which of the following neurons in the spinal cord=Spinothalamic neuron in lamina propria

DORSAL COLUMN–MEDIAL LEMNISCUS PATHWAY

- Sense of fullness of bladder and rectum are carried by= Dorsal Column Medial (DCML)
- Patient falls when eyes closed. Cause= Dorsal column lesion
- Proprioception are carried by which fibres= Dorsal column
- Regarding Posterior gray column tracts= One extend until the whole length of spinal cord
- Tabes dorsalis bladder Atony reason= Dorsal column ganglion effected.
- Dorsal column damage which will least affected= crude touch
- Synapses absent in= Dorsal root ganglion
- In dorsal column of posterior cord which neurotransmitter is present between dorsal root ganglion and pain inhibitory fibers in spinal cord= Enkephalin
- Dorsal column medial leminiscus associated with= Vibration
- In spinal cord, the fibers from lower limb and upper limb in post column goes in which manner= Medial to lateral
- A pt with Loss of vibration. Lesion at= Dorsal column
- Lesion in dorsal column medial lemniscus system causes= Sensory ataxia
- Joint position error in= Medial lemniscus system
- Medial leminiscus is formed by decussation of= Internal arcuate fibers
- Lesion to medial lemniscus at the level of mid brain will cause loss in=Fine touch
- Pt has lost fine touch vibration and proprioception in left leg. Lesion is in=Nucleus gracilis
- Decrease proprioception in lower leg association= Fasciculus gracilis
- Damage to dorsal horn of spinal cord (DCML) at spinal cord level leading to ataxia results in=Proprioception not reaching sensory cortex

CORTICOSPINAL TRACT

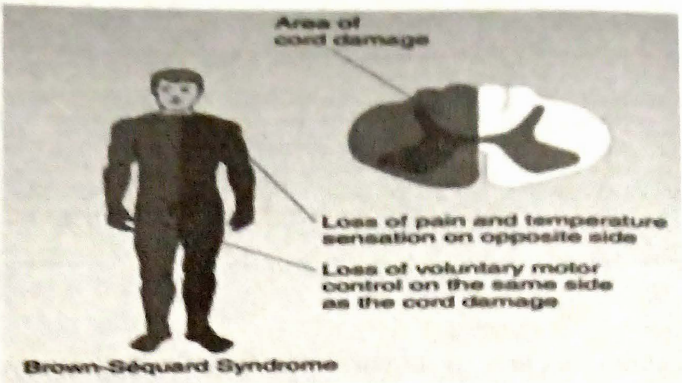
- Fine movements of hand are controlled by= cerebellum
- Fine movements of hand are conducted by=corticospinal tract
- A 26 yr old man had gun shot wound to the spine after which he lost sensations to lower limbs, loss of power but increased tone and up going plantar with central clonus lesion at=Both corticospinal and lateral spinothalamic

---

12. PATIENT WITH INJURY TO LEFT 8TH CERVICAL SEGMENT OF SPINAL CORD WILL NOT SHOW FOLLOWING SIGN = DEC SENSE OF PAIN AND TEMPERATURE BELOW THE LESION ON SAME SIDE

REMEMBER: BROWN-SÉQUARD SYNDROME (EFFECT OF HEMISECTION OF SPINAL CORD) FINDINGS:

- Ipsilateral loss of all sensation at level of lesion
- Ipsilateral loss of proprioception, vibration and position and touch
- Contralateral loss of pain, temperature, and crude (non-discriminative) touch


Area of cord damage
Loss of pain and temperature sensation on opposite side
Loss of voluntary motor control on the same side as the cord damage

Brown-Séquard Syndrome

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Spinal hemi-section done there would be = Contralateral loss of pain and temperature
- Hemi section of spinal cord done. What symptoms will be observed below the level of lesion=Contralateral loss of pain and temperature
- A 45-year man presents with inability to feel heat or cold on the left side of his body. On examination, there is loss of vibration, position sense, deep touch, and motor functions of the right lower limb. What is the most likely diagnosis=Right Brown Sequard syndrome
- A security guard had a gun-shot injury on lower back and later referred to physiotherapy and rehabilitation. He had lost contralateral pain and temp below the level of lesion and ipsilateral loss of vibration. What is diagnosis=Brown Sequard syndrome
- Hemi section with total spinal section is differentiated by=Spinal shock
- Right side touch while left side temp and pain loss= Right Hemisection.
- Below Hemisection of Spinal Cord, Ipsilateral loss=UMN type paralysis
- Mid thoracic hemi section of spinal cord= Spastic paresis and positivity Babinski sign
- Right lower limb paralysis with loss of pain at T9, loss of vibration at T8 and bilateral reflexes are normal. Diagnosis= Lesion of spinothalamic tract at T8
- Contralateral loss of pain and temp at T9 and ipsilateral loss of proprioception below T8, bilateral normal reflexes= Lesion of spinothalamic tract at T8
- A patient presented with hemi section of spinal cord at mid thoracic level. What changes regarding upper motor neuron will be seen= Increased muscle tone and hyperreflexia ipsilaterally
    - It also comes as with different options sometimes
        - A Boy with hemi section mid thoracic, UMN injury is suspected. Features present will be of=Ipsilateral spastic paresis+ hyperreflexia
- Regarding spinal cord lesion at C7=Contralateral loss of pain and temperature below lesion
- Loss of all sensations bilaterally below lesion by= Complete cord transaction
- Mass reflex is demonstrated in patient suffering from= Complete transection of spinal cord

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313. LOWER MOTOR NEURON LESION = FLACCID PARALYSIS

REMEMBER

- Lower motor neuron = everything lowered (less muscle mass, ↓ muscle tone, ↓ reflexes, downgoing toes).
- Upper motor neuron = everything up (↑tone, ↑reflexes, Upgoing toes).
- Remember Babinski sign→ big toe goes upward, seen normally in infants, and in UMN lesions

	UMN lesion	LMN lesion
Weakness	+	+
Atrophy	−	+
Tone	↑	↓
Reflexes	↑	↓
Fasciculations	−	+
Babinski	+	−

Spastic paresis	+	–
Flaccid paralysis	–	+
Clasp knife spasticity	+	–

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

Lower Motor Neuron

- ❖ Significant finding of LMN lesion= Muscle wasting
- ❖ Wasting occurs in= LMN lesion
- ❖ Pt having left leg muscle weakness and atrophied and Cox Vera deformity cause= Lower motor neuron lesion
- ❖ Person having weakness in lower leg and decrease reflexes Lesion in= Lower motor neuron lesion
- ❖ Left leg paralysis there was atrophy and stretch reflexes were absent. Diagnosis= Lower motor neuron lesion
- ❖ Injury causing hyperextension of neck and damage to cervical cord= LMN lesion of upper limb

Upper Motor Neuron

- ❖ Upper motor neurons lesion=Exaggerated deep tendon jerks
    - o It also comes as with different options
        - ▪ Which of the following will show characteristics of upper motor neuron lesion in cortex=Increased muscle tone
        - ▪ Feature of Lesion of upper motor neuron= Clasp knife spasticity
- ❖ Old patent presents with weakness in all arms, clasp knife rigidity and hyper-reflexia, diagnosis = Upper motor neuron lesion
- ❖ An old patient with weakness of muscles of upper body, hyper-reflexia of knee and ankle joints and history of urinary dribbling, what is the diagnosis = Upper motor neuron lesion
- ❖ A 65-year male develops right sided hemiplegia and slight deviation of angle of mouth to the left while talking. He is able to close his eyes on command. What other finding can be present = Clasp knife rigidity
- ❖ A patient shows weakness on movements of arm and hand, there is slight atrophy of the arm muscles, hyperreflexia and slight clasp-knife spasticity. The most likely cause is due to= Upper motor neuron lesion
- ❖ Pt complains of paresis of limbs due to UMN injury. Site of lesion is=Corticospinal tract and corticobulbar tract

Others

- ❖ Increased neural activity before a skilled voluntary movement is first seen in=Cortical association areas
- ❖ Final common Motor pathway=Alpha efferent of spinal motor neuron
- ❖ Patient having hemiplegia on left side, motor neuron lesion plus homonynomas hemianopia. Lesion at=Forebrain
- ❖ Pendular knee jerk occurs in=Cerebellar dysfunction
- ❖ After RTA, pt presents with spinal cord injury. Findings will be= Spastic paralysis

314. All are sign of pyramidal tract lesion, except=Tremors

Remember

Pyramidal tract lesions	Extra pyramidal tract lesions (movement disorders)
• Clasp knife spasticity.	• Rigidity (Lead pipe / cogwheel)
• Hyperreflexia	• Tremor
• Absent abdominal reflexes	• Hypokinesia
• Positive Babinski (Extensor plantar)	• Chorea/Athetosis/Hemiballismus

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Upper motor neuron signs and symptoms= Pyramidal tract lesions
- Analysis of the clasp knife reflex suggests that the reflex most likely= Is a flexion reflex induced by stimulation of nociceptors
- Lesion in pyramidal tract will lead to loss of which function= motor
    - It also comes as
        - A patient presents with trauma to the medulla which resulted in damage to the pyramidal area. The function most likely to be affected is= Motor function
- All are sign of pyramidal tract lesion, except=Tremors
- Extrapyramidal side effects= Parkinsonism
- What type of motor fibers are given by the pyramidal tract= Alpha & gamma motor
- The most likely feature of pyramidal tracts is= Contain descending corticospinal fibres derived from the ipsilateral cerebral cortex
- Babinski's sign positive, is observed in a neuronal lesion involving= Medullary pyramids
- Abnormal Babinski reflex occurs due to lesion in= Pyramid

KNOW THE DIFFERENCE.

- The clinical sign attributed to lesion in pyramidal tract is= Clasp knife spasticity
- The clinical sign attributed to lesion in extra pyramidal tract is= lead pipe rigidity
    - In a few papers the only suitable option was clasp knife rigidity—go for that. Like this MCQ below
    - Lesion in extrapyramidal tract will show which of the following= Clasp knife rigidity

---

315. PARASYMPATHETIC ACTION= INCREASE GIT PERISTALSIS

NOTE THE EFFECT OF THE AUTONOMIC NERVOUS SYSTEM ON ORGAN SYSTEMS

✓ Remember a rule, α1 is for constriction, α2 is for inhibition, β1 is for heart, β2 is for relaxation

Organ	Sympathetic Action	Parasympathetic Action
Heart	↑ heart rate ↑ contractility ↑ AV node conduction	↓ heart rate ↓ contractility ↓ AV node conduction
Vascular smooth muscle	Constricts blood vessels in skin; splanchnic. Dilates blood vessels in skeletal muscle	------------ ------------
Gastrointestinal tract	↓ motility Constricts sphincters	↑ motility Relaxes sphincters
Bronchioles	Dilates bronchiolar smooth muscle	Constricts bronchiolar smooth muscle
Male sex organs	Ejaculation	Erection
Bladder	Relaxes bladder wall Constricts sphincter	Contracts bladder wall Relaxes sphincter
Sweat glands	↑ sweating	-------------
Eye	Dilates pupil (myDriasis)-- (far vision)	Constricts pupil (miosis)-- (near vision)
Kidney	↑ renin secretion	--------------
Fat cells	↑ lipolysis	--------------

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

SYMPATHETIC

- Patient had an accident of cervical region leading to damage of cervical ganglion. What will be affected = Same side pupil constricted.
- Cervical sympathetic chain damage causes = Meiosis of affected side.
- Role of sympathetic nervous system via alpha nerves = Pupillary dilatation.
- Sympathetic cholinergic stimulation causes = Vasodilation in skeletal muscle.
- Sympathetic muscarinic = Sweat gland.
- In a patient with sympathetic stimulation, what effect will occur on his heart = Decreased AV nodal delay.
- Sympathetic fibers in = Each spinal nerve.
- Sympathetic through alpha-adrenergic = Control radial muscle of iris.
- Stimulant for renin release = Sympathetic stimulation.
- Neuromuscular junctions of cardiac muscles supplied by sympathetic and parasympathetic nerves are = Postganglionic.
- Sympathetic system acts on what = Pylorus sphincter.
- Adult resting male heart rate 160, BP 130/90, CVP 8. Cause = Sympathetic overactivity.
- A young patient's blood pressure is 150/95. His serum renin level is higher than normal. Which of the following is the STIMULUS for this increased level of renin = Increased sympathetic stimulation via renal nerves.
- Ejaculation by = Sympathetic.
  - Remember if pudendal nerve in option prefers that (ref first aid pg. 593, Ed 2017)

PARASYMPATHETIC

- Parasympathetic system = Increases secretion of salivary gland.
- Which of the following is a parasympathetic response = Increase salivation.
- Parasympathetic increases salivary secretion, through which of the following will it act on blood vessels = VIP.
- Effect of parasympathetic on heart = Prolong PR interval.
- Parasympathetic stimulation caused = Opens intestinal sphincters.
- Sensation of distention of rectum is carried by = Parasympathetic.
- During sexual excitement in females, fluids are secreted by vaginal walls mainly due to = Parasympathetic stimulation.
- Distention of rectum is caused by = Parasympathetic.
- Parasympathetic component is in = Pelvic splanchnic nerve.
- Regarding parasympathetic system = Pelvic splanchnic nerves are parasympathetic.
- Parasympathetic cut down which organ mostly affected = GIT muscles.
- Parasympathetic cut down which organ mostly affected = GIT muscles.
- When the vagal supply is cut, which group of muscles is most affected = GI muscles.
- In parasympathetic denervation most likely part affected is = GI muscles.
- Lacrimal gland receives parasympathetic from Pterygopalatine ganglion that receives preganglionic fibers from = Greater petrosal nerve.
  - Note: Preganglionic parasympathetic secretomotor fibers are carried by the greater petrosal nerve and postganglionic sympathetic fibers are carried by the deep petrosal nerve.

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318 **ALPHA ADRENERGIC CAUSES = MYDRIASIS**

NOTE THAT

- ✓ Alpha stimulation (sympathetic action) causes **D**ilates pupil= my**D**riasis
- ✓ While parasympathetic action causes= Constricts pupil (miosis)

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- A man during road accident suffered injury to cervical sympathetic chain. Most likely change that will occur= Ipsilateral miosis
- RTA, injury to cervical sympathetic chain. What will happen= Constriction of pupil
- Role of sympathetic nervous system via alpha nerves= Pupillary dilatation
- Parasympathetic= Decreases pupil size
- Which of the following will help in dilation of pupil in sympathetic stimulation= Alpha receptor

317. PT PRESENTED TO OPD WITH HORIZONTAL DIPLOPIA, MYDRIASIS, PTOSIS, ANISOCORIA. NERVE INVOLVED IS= OCULOMOTOR

REMEMBER A SHORT CUT

Ptosis + dilated pupil = third nerve palsy	Ptosis + constricted pupil = Horner's

ALSO NOTE THIS

Mydriasis	❖ congenital ❖ Third nerve III palsy ❖ Holmes-Adie pupil ❖ Pheochromocytoma ❖ Drug causes of mydriasis o Atropine, amphetamines, cocaine, TCAs
Miosis	❖ Congenital ❖ Senile miosis ❖ Horner's syndrome ❖ Argyll-Robertson pupil ❖ Pontine hemorrhage ❖ Drugs causes: o Opiates (morphine), organophosphate toxicity, Pilocarpine
Ptosis	Causes of bilateral ptosis: ❖ Myotonic dystrophy ❖ Myasthenia gravis* ❖ Syphilis ❖ Congenital Causes of unilateral ptosis: as above plus: ❖ Third nerve palsy ❖ Horner's
Horner Syndrome Mnemonic→ PAM is horny (Horner)	❖ Sympathetic denervation of face: ❖ Ptosis (slight drooping of eyelid: superior tarsal muscle) ❖ Anhidrosis (absence of sweating) and flushing of affected side of face ❖ Miosis (pupil constriction) ❖ Associated with lesion of spinal cord above T1 (e.g., Brown-Séquard syndrome, late-stage syringomyelia) or Pancoast tumor), Any interruption results in Horner syndrome

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- A 15 years old girl with fixed dilated pupils. Lesion is at = Occulomotor nerve
- A 30 year old lady presented with history of fever, headache and diplopia. On examination, she has ptosis, mydriasis, anisocoria and crossed horizontal diplopia. The most likely cause is= Oculomotor nerve palsy
  - o It is also asked as

- 30 years old female with fever, headache, ptosis, mydriasis, and isochoric bilateral horizontal diplopia. Nerve involved is= Oculomotor nerve

- ❖ Diabetic male presents with Rt sided ptosis and pupil size small. Diagnosis= Horner
- ❖ Post syphilitic pt. can't constrict pupil on light, with intact accommodation= Argyll-Robertson pupil
- ❖ Pinpoint pupil and respiratory depression scenario. Which drug overdose is it= Morphine
- ❖ A drug taken in overdose. After few mintutes patient has pinpoint pupil, respiratory depression semi-comatose. Drug is most probably= Morphine
- ❖ Morphine side effect= Meiosis bradycardia

8. FAST PAIN FIBERS = A-DELTA

REMEMBER TYPES OF NERVE FIBERS

- ❖ General fibers are classified into A, B and C
- ❖ A, B are myelinated and Fast, while C is unmyelinated and slow
- ❖ The group A is further subdivided into alpha(α), beta(β), gamma(γ), delta(δ)
- ❖ As we go down from A to C, the diameter and velocity decreases

General Fiber Type	Sensory Fiber Type	Example	Diameter	Conduction Velocity
Aα	Ia	Muscle spindle	Largest	Fastest
	Ib	Golgi tendon organs		
Aβ	II	Touch and pressure	Medium	Medium
Aγ		Intrafusal fibers		
Aδ	III	Crude Touch, pressure Temperature, and Pain (**FAST**)	Small	Medium
B		**Preganglionic** autonomic fibers	Small	Medium
C (unmyelinated)	IV	**Postganglionic** autonomic Temperature and Pain (**SLOW**) Tickling sensation	Smallest	Slowest

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- ❖ The fastest nerve conduction occurs in=A-Alpha
- ❖ Sensation (sterogonosis) from lips carried by= A beta
- ❖ Proprioception from finger is caused by= A beta
- ❖ Pain from fingertips is carried by =A delta fibers
- ❖ Fast Pain fibers= A delta
- ❖ The fibers transmitting pain and pressure are= A Delta fibers
- ❖ Pain fibers travel through which one of the following = A-Delta
- ❖ Receptors for cold= A-delta (Both C fibers and A delta)
- ❖ Presynaptic cholinergic fibers travel thru = B-fibers
- ❖ Type of fibers in Preganglionic autonomic fibers = B type
- ❖ Type of autonomic preganglionic fibers= B fibers
- ❖ Postganglionic fibers = C (unmyelinated)
- ❖ Fibers of pain and warmth= C fibers
- ❖ Tickle sensation are carried by= C fibers
- ❖ Pain fibers are= un encapsulated
- ❖ Which of the following is a sensory non-adapting receptor= Pain
- ❖ A lady in kitchen cut her radial artery accidently which mechanism will reduce pressure in vessel and stop bleeding= Post ganglionic C

- Immediate effect of Local anesthesia on which fibers= C-Fibers
    - (Remember the sequence beta fibers > c fibers > A delta—and in last A-alpha fibers Ref: Neural Blockade in Clinical Anesthesia and Management of Pain, Volume 494 Edited by Michael J. Cousins Phillip O)

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319. SYMPATHETIC CHOLINERGIC FIBERS RELEASES =ACETYLCHOLINE

REMEMBER ABOUT THE SYMPATHETIC AND PARASYMPATHETIC FIBERS

Sympathetic Fibers	Parasympathetic Fibers
Preganglionic Fibers→ Acetylcholine (ACh)	Preganglionic Fibers→ ACh
Postganglionic Cholinergic Fibers→ ACh (e.g. sweat glands)	Postganglionic Fibers→ ACh
Postganglionic Noradrenergic Fibers→ Noradrenaline	

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Sympathetic fibers among the following= Postganglionic noradrenergic fibers
- Post ganglion sympathetic fibers release ACh on muscarinic receptors in which tissue= Sweat gland
- Neurotransmitter of post ganglionic sympathetic fibers= Nor adrenaline
- Preganglionic sympathetic nerves fibers are = cholinergic
- Post ganglionic sympathetic nerve fibers are =adrenergic
- Muscarinic cholinergic postganglionic sympathetic nerve fiber to= Sweat gland
- Regarding adrenergic receptors= Sympathetic postganglionic
- Postganglionic fibers present in= All Spinal nerves
- Which of the following is supplied by muscarinic cholinergic via post ganglionic sympathetic fibers=Sweat glands
- Post ganglion sympathetic fibers release ACh on muscarinic receptors in which tissue=Sweat gland
- Preganglionic sympathetic fibers to adrenal medulla is via=Cholinergic
- Norepinephrine is released at=Post ganglionic sympathetic
- Regarding fibers of adrenal medulla= preganglionic reaches through splanchnic nerves
- Post ganglionic sympathetic fibers are present in=All spinal nerves
- Cholinergic fibers are richly present in= Nucleus basalis of Meynert
- About autonomic nervous system= Preganglionic autonomic nervous system always works by acetylcholine
    - This also come as
        - Regarding autonomic nervous system= All parasympathetic secrets ACh secreting

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320. WHICH NEUROTRANSMITTER IS INVOLVED IN TRANSMISSION OF PAIN WHEN A FINGER IS CUT WITH A KNIFE= GLUTAMATE

REMEMBER ABOUT NEUROTRANSMITTERS.

- Corticostriatal fibers = glutamate
- Rods and cones = glutamate
- Stimulatory neurotransmitter in cerebellum is: glutamate
- Fast pain: glutamate
- Slow pain = substance- P,
- REM sleep = Ach
- Pain inhibitory fibers = enkephalin (endogenous opioids)
- Pain mediated by- Bradykinin and PGE
- Nigrostriatal fibers = dopamine
- Emotions= dopamine
- Brain stem striatal fibers = serotonin
- Mood and behavior= serotonin

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Which one of the following is a Mediator of Fast pain= Glutamate
- Mediator of slow pain fibers is= Substance-P
- A patient suffers from appendicitis. Peripheral blood shows leukocytosis. Pain will be mediated by=Bradykinin and prostaglandin E
- Which of the following is the most potent pain mediator=Bradykinin
- The neurotransmitter which is secreted at autonomic ganglia is= ACh
- Neurotransmitter released at the Postganglionic sympathetic endings are mostly= Noradrenergic with few exception
- What is released at pain inhibitory fibers when they come in contact with incoming fibers= Enkephalin
- Neurotransmitter associated with emotions= Dopamine
- Neurotransmitter of outflow of basal ganglia is=GABA
- Which part of limbic system associated with emotions= amygdela
- A 14-year-old boy gets his finger cut by a knife. Which one of the following is primary/early mediator of acute inflammatory response in this=Histamine
- Most common inflammatory mediator= Histamine
- Immediate mediator of allergic reaction=Histamine
    - While Mediators of chronic allergic rhinitis is eosinophils
- Neurotransmitter for mood is= Serotonin
- The neurotransmitter which is secreted at autonomic ganglia is= Ach
- Neurotransmitter present in the Nigrostriatal pathway of caudate and putamen=Dopamine
- Neurotransmitter in REM sleep=Acetylcholine
- Neurotransmitter in slow wave sleep (NREM)=Serotonin
- Neurotransmitters are released from nerve-endings while hormones are secreted bythe endocrine cells. One of the following is both a hormone as well as a neurotransmitter= Adrenaline
- Basal ganglia & substantia nigra release what to stop seizure= GABA
- Inhibitory neurotransmitter of substantia nigra is= GABA
- A chemical neurotransmitter cause initiation of labor and cervical ripening=Nitric oxide

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21. STEADY PRESSURE IS DETECTED BY= RUFFINI

REMEMBER FOR RECEPTORS

Receptor Type	Fiber Type	Adaptation rate	Senses
Free Nerve Endings	C—slow, unmyelinated fibers Aδ—fast, myelinated fibers	❖ Tonic or phasic	❖ Pain ❖ Temperature
Meissner Corpuscles	Large, myelinated fibers; adapt quickly	❖ Phasic	❖ Dynamic (velocity) ❖ Fine/light touch ❖ Two point discrimination ❖ Position sense ❖ Vibration (Low frequency)
Pacinian Corpuscles	Large, myelinated fibers; adapt quickly of all	❖ Phasic	❖ Pressure ❖ Vibration (High frequency)
Merkel Discs	Large, myelinated fibers; adapt slowly	❖ Tonic	❖ Pressure ❖ Deep static touch (e.g., shapes, edges). ❖ Position sense (location)
Ruffini Corpuscles	Adapt slowly	❖ Tonic	❖ Pressure

			❖ Slippage of objects along surface of skin, ❖ Joint angle change ❖ Detects warm temperature
Krause bulb		❖ Phasic	❖ Detects Cold temperatures

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

PACINIAN

- Which Encapsulated fibers lying deep in whole body can feel pressure and vibrations and feel pressure on face as well= Pacinian corpuscles
- Regarding Pacinian corpuscles= Rapidly adapting tactile sense
- Regarding Pacinian corpuscles= Detect high frequency vibration
- Regarding Pacinian corpuscles which of following true= Phasic
- 256Hz tuning fork vibration is perceived by= Pacinian corpuscles
- Which of the following adequately describes Pacinian corpuscles=Rapidly adapting pressure receptors
- Tuning fork placed over the head of a patient. Vibrational sensation will be detected by= Pacinian corpuscles
- Encapsulated receptors for vibration= Pacinian corpuscles
- Phasic, high vibration and rapidly adapting receptors are= Pacinian corpuscle

MEISSNER

- Receptors abundant on tip of finger=Meissner
-
- Tactile two-point discrimination is done by=Meissner corpuscles
- Tactile sensations from the finger Tips are detected by which receptors=Meissner
- Receptors on hairless skin= Meissener's
    - Also, remember for two-point discrimination
        - Maximum two-point discrimination is present on= Lips
        - Minimum two-point discrimination is present on= Scapula
        - Loss of Two-point discrimination after RTA. Lesion in=Lateral inhibition

RUFFINI

- Sensory receptor that detects steady pressure are=Ruffini corpuscle

KNOW THE DIFFERENCE

- Similarity btw the function of Meissner and Pacinian is= Vibration
    - Meissner Corpuscles senses= low frequency vibration
    - Pacinian Corpuscles senses= high frequency vibration
- Tactile sensations from the finger Tips are detected by which receptors= Meissner corpuscle
    - (Ref: Guyton page 607, topic detection and transmission of tactile sensation)
    - Also remember that Merkel discs are also present on finger tips, but associated with deep static touch
- Rapidly adapting receptor= Meissner
    - Note in this question there was no option of Pacinian,
    - Remember repeatedly asked rapidly adapting receptors are Pacinian, Meissener's & Krause end bulb
    - While Golgi, Merkels and Ruffini are slow adapting receptors
- When body will be cold which one will be stimulated= Krause bulb
    - While for warmth is Ruffini

FREE NERVE ENDING

- Free nerve endings= Pain
- Which of the following is a non-adaptive receptor=Free nerve ending
    - It is also asked as
        - Which of the following is a sensory non-adapting receptors= Pain (nociceptors)
- When temperature of skin reaches 52-degree centigrade which receptors are stimulated= Nociceptive receptors
- Hot sauce sensation on tongue activates= Nociceptor
- Unmyelinated nociceptive primary afferent fibers synapse directly to one of the following neurons in the spinal cord= Spinothalamic neurons in lamina I
- Primary afferents from nociceptors terminate in= Lamina 1 of spinohthalmic tract
- Gate control theory of pain= Sensory non noxious stimulus
- Slow, burning pain is due to= Polymodal nociceptors that respond to irritants
- Walking barefoot. Feet on pointed thing. Pointed object touches the foot. Reflex is initiated by= free nerve ending
- Withdrawal reflex by= free nerve ending
- Nociceptors are present in= Meninges

OTHERS

- Mechanoreceptors of Warm =Long Receptive Field
- Uncapsulated nerve fibers for touch are = Merkle discs.
- The part of spinal gray matter receiving noxious stimulus is= Lamina I
- Primary afferents from nociceptors terminate in= Lamina 1 of spinothalamic tract
- Stimulus for high threshold mechanoreceptor is received by= Lamina 1
    - **Note**
        - Lamina I: Processes fast pain signals
        - Lamina II (substantia gelatinosa): Primarily processes slow pain signals

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22. THORACOLUMBAR OUTFLOW IS= SYMPATHETIC

NOTE THAT.

- ✓ Sympathetic nervous system originates in spinal cord segments T1–L2 or the thoracolumbar region.
- ✓ Parasympathetic nervous system originates in the nuclei of cranial nerves (3, 7, 9, and 10) and in spinal cord segments S2–S4 or the craniosacral region.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Lower respiratory bronchioles sympathetic supply= T3-T4
- Neck of bladder and urethra nerve supply= Sympathetic L1- L2
- Which cranial nerves carry parasympathetic fibers= Third, Seventh, Ninth, Tenth
- Outflow of T1 -L3 is= Sympathetic

MIDDLE MENINGEAL ARTERY =PASSES THROUGH FORAMEN SPINOSUM

REMEMBER CRANIAL NERVES PATHWAY AND FORAMENS

Anterior Cranial Fossa	❖ Cranial nerve I→ Cribriform plate
Middle Cranial Fossa (CN II–VI)	❖ Contains cranial nerve from (CN II–VI)—through sphenoid bone ❖ Optic Canal ○ Cranial nerve II,, ophthalmic artery, central retinal vein ❖ Superior orbital fissure ○ Cranial nerve (CN III, IV, **V_1**, VI), ophthalmic vein ❖ Foramen **R**otundum-----**V2** (maxillary branch of trigeminal nerve) ❖ Foramen **O**vale-----------**V3** (mandibular branch of trigeminal nerve)

	❖ Foramen Spinosum------Middle meningeal artery **MNEMONIC:** Cranial nerve **V** → **S**tanding **R**oom **O**nly
Posterior Cranial Fossa (CN VII–XII)	❖ Contains CN VII–XII—through temporal or occipital bone ○ Internal auditory meatus→ Cranial nerve (CN VII, VIII) ○ Jugular foramen→ Cranial nerve (CN IX, X, XI, jugular vein) ○ Hypoglossal canal→ CN XII

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ Mandibular branch of Trigeminal nerve passes through = Foramen ovale
- ❖ Vagus nerve passes through = jugular foramen
- ❖ Abducent nerve passes through= cavernous sinus
- ❖ Foramen Rotundum damaged which structure will be severed= Maxillary branch of trigeminal nerve.
- ❖ Middle meningeal artery in the= Foramen Spinosum
- ❖ Accessory nerve passes through which foramen= Jugular foramen
- ❖ Lesion below foramen Ovale causes paralysis of= Lower part of face/jaw
- ❖ Nerve in foramen Ovale damaged nerve supply of which part will be affected= Lower face
- ❖ Accessory meningeal artery enters through which foramen= Ovale

324. TUMOR COMPRESSING OPTIC CHIASMA WOULD CAUSE = BITEMPORAL HEMIANOPIA

- ❖ Pituitary adenoma, craniopharyngioma both causes= bitemporal hemianopia
- ❖ A patient has Bitemporal hemianopia. Lesion is at= Optic chiasma
  - ✈ If asked between upper, middle or lower part= choose Middle/Central part of optic chiasma (if only upper and lower part in options prefer upper part)
- ❖ If Bitemporal hemianopia due to aneurysm of artery? = Ant communicating artery

NOW LET'S PRACTICE SOME PAPER MCQ'S

OPTIC CHIASMA COMPRESSION

- ❖ Tumor compressing optic chiasma will result in? = Precocious puberty
  - ○ Know the difference options also include precocious puberty in the below mcq
  - ○ In addition to blindness, a lesion that destroys the optic chiasma and the immediately related overlying part of the hypothalamus would most likely cause= Hyperphagia
- ❖ Left leg hemiplegia with lower face weakness and bitemporal hemianopia? = Pituitary gland
- ❖ Pituitary tumor compressing optic chiasma will cause? = Bitemporal hemianopia
- ❖ A woman with pituitary tumor causing increased prolactin, amenorrhea, and bitemporal hemianopia. Affected part is? = Middle part of optic chiasma
- ❖ A patient with bitemporal hemianopia and raised prolactin. Pathology most likely in? = Pituitary gland

PROLACTINOMA AND HYPERPROLACTINEMIA

- ❖ Prolactin raised with infertility. What will be the cause? = Microprolactinoma
- ❖ A patient suffered from bitemporal hemianopia with raised prolactin. Most likely condition associated with it? = Pituitary adenoma
- ❖ A female with high prolactin levels and bitemporal hemianopia. What is the most likely cause? = Prolactinoma
- ❖ A tall man with bitemporal hemianopia and infertility. What is the most likely cause? = Prolactinoma
- ❖ A patient with prolactinoma can't see on B/L lateral sides. The cause is? = Bitemporal hemianopia
- ❖ A tall man with bitemporal hemianopia and Impotence likely has? = Prolactinoma

PITUITARY ADENOMA

- ❖ Pituitary adenoma invades which bone? = Sphenoid bone

- A patient with bitemporal hemianopia and raised prolactin levels. Likely cause? = Pituitary adenoma

325. ANTERIOR EXTENSION OF PITUITARY ADENOMA WILL COMPRESS=OPTIC NERVE

NOTE

- Anteriorly= Optic nerve
- Superiorly= Optic chiasma
- Lateral= Cavernous sinus

326. A 25-YEAR FEMALE COMPLAINS OF GALACTORRHEA AND SECONDARY AMENORRHEA. HER SERUM PROLACTIN IS 6000 WITH NO OTHER SIGNS OF COMPRESSION. WHAT IS THE LIKELY DIAGNOSIS=MACROPROLACTINOMA

KNOW THE DIFFERENCE

- If level of Prolactin <1000 its because of =stress or drugs
- If Between 1000-5000 its because of = microadenoma
- If >5000 its because of = macroadenoma

327. MOST COMMON NEURAL TUBE DEFECT IS=SPINA BIFIDA

REMEMBER NEURAL TUBE DEFECTS

- Neuropores fail to fuse (4th week) → persistent connection between amniotic cavity and spinal
- canal.
- Associated with maternal diabetes and folate deficiency.
- ↑α-fetoprotein (AFP) in amniotic fluid and maternal serum (except spina bifida occulta = normal AFP).
- ↑ acetylcholinesterase (AChE) in amniotic fluid is a helpful confirmatory test.

Spina bifida occulta	Failure of caudal neuropore to close, but no herniation
Meningocele	Meninges (but no neural tissue) herniate through bony defect
Myelomeningocele	Meninges and neural tissue (eg, cauda equina) herniate through bony defect
Anencephaly	Failure of rostral neuropore to close → no forebrain, open calvarium. Clinical findings: polyhydramnios (no swallowing center in brain).

NOW LET'S PRACTICE SOME PAPER MCQ'S

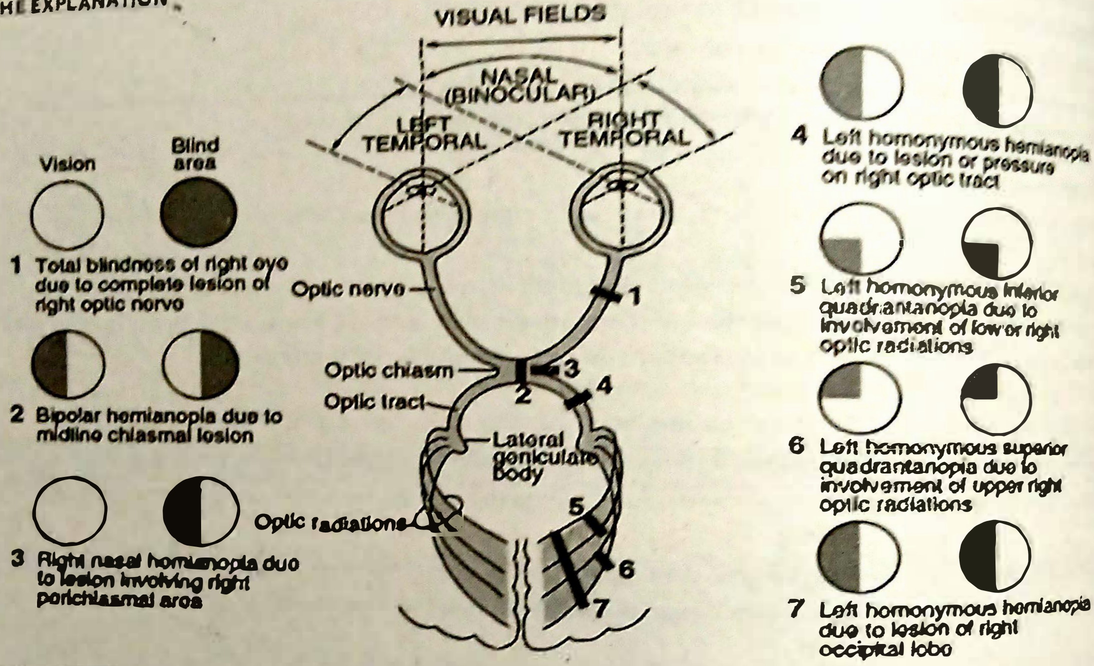
- Baby born with a sac like defect in the lumbosacral region with neural tissue in it, diagnosis=Myelomeningocele
- Baby born with a sac like defect in the lumbosacral region without neural tissue in it, diagnosis= Meningocele
- One of the following conditions is due to neural tube defect = Meningocele
- Spina bifida occurs due to failure of vertebrae=In which vertebral arches do not fuse
- Spina bifida is caused due to deficiency of? = Folate
- Which of the following is increased in Spina bifida? = AFP
- A 16 weeks' pregnant lady with U/S finding increased amniotic fluid was advised to do a B-Hcg and AFP after two weeks. Later AFP comes out to be raised. Likely diagnosis is=Anencephaly
- Pregnant woman lacking green vegetables, fetal pathology? = Anencephaly
- A 30-year-old female gave birth to a child with Frog eye appearance. This is likely a feature of? = Anencephaly
- Fetus with open calvarium and raised AFP diagnosis = Anencephaly

328. RIGHT OPTIC TRACT LESION CAUSES= LEFT HOMONYMOUS HEMIANOPIA

ALSO NOTE THIS

- Lesion at left optic tract causes which lesion= Right homonymous hemianopia
- Lesion at right optic tract causes which lesion= left homonymous hemianopia
- Lesion of Lt. lateral geniculate body causes= Rt homonymous hemianopia
- Lesion of Rt. lateral geniculate body causes= Left homonymous hemianopia
- Homonymous hemianopia lesion is at = optic tract
- Homonymous hemianopia + macular sparing lesion is at = visual cortex
- Bitemporal hemianopia lesion is at = Optic chiasma
- Pt can't see the left temporal and right nasal fields. Where is the lesion= Right optic tract.
- Bitemporal vision loss is most commonly caused by= Pituitary tumor
- Patient having hemiplegia on left side, moto neuron lesion plus homonynomas hemianopia. Lesion Forebrain
- Frontal lobe tumor in a lady with optic tract effected will lead to= Homonymous hemianopia

HERE IS THE EXPLANATION


VISUAL FIELDS
NASAL (BINOCULAR)
LEFT TEMPORAL
RIGHT TEMPORAL
Vision
Blind area
1 Total blindness of right eye due to complete lesion of right optic nerve
2 Bipolar hemianopia due to midline chiasmal lesion
3 Right nasal hemianopia due to lesion involving right perichiasmal area
Optic nerve
Optic chiasm
Optic tract
Lateral geniculate body
Optic radiations
1
2
3
4
5
6
7
4 Left homonymous hemianopia due to lesion or pressure on right optic tract
5 Left homonymous inferior quadrantanopia due to involvement of lower right optic radiations
6 Left homonymous superior quadrantanopia due to involvement of upper right optic radiations
7 Left homonymous hemianopia due to lesion of right occipital lobe

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329. A PATIENT PRESENT WITH UNILATERAL FACIAL PALSY, IPSILATERAL HEARING LOSS AND NYSTAGMUS...THE LIKELY SITE OF LESION IS= CEREBELLOPONTINE ANGLE

NOTE THE KEY FEATURES OF THE LESION

Features	Lesion
Intention tremor, coarse tremor Nystagmus Dysdiadokinesia (impaired ability to perform rapid, alternating movement) Dysmetria (inability to perform point-to-point movements or abnormal finger nose test in simple words—or simpler past pointing Swaying to same side of lesion Pendular knee jerk	Cerebellar dysfunction
Resting tremor (Pill-rolling tremor)	Substantia nigra (Parkinson disease)
Chorea (Sudden, jerky, purposeless movements)	Basal ganglia (Caudate)
Athetosis (Slow, snake-like, writhing movements)	Basal ganglia

❖ Anterograde amnesia (inability to make new memories)	❖ Hippocampus (bilateral)
❖ Wernicke-Korsakoff syndrome o Mnemonic: Wernicke problems come in a **CAN O'** beer • "**C**onfusion, **A**taxia, **N**ystagmus, **O**phthalmoplegia" o Note: In alcoholic or malnourished patients, give thiamine before dextrose to Dec risk of precipitating Wernicke encephalopathy	❖ Mammillary bodies (bilateral) & medial thalamus
❖ Klüver-Bucy syndrome o Disinhibited behavior o (E.g. Hyperphagia, hypersexuality, hyperorality).	❖ Amygdala (bilateral)
❖ Reduced levels of arousal and wakefulness (e.g., coma).	❖ Reticular activating system (midbrain)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Basal ganglia send excitatory signals to= Cerebral cortex
- A section of the caudal pons shows HORIZONTAL fibers. These fibers most likely consist of= Middle cerebellar peduncle
- Part of brain receive excitatory input from cerebral cortex but does not send it back= Substantia Nigra
- A pt having resting tremor, mask face (scenario of Parkinsonism). Where is lesion= Substantia nigra
- Cerebellar lesion occurs all except= Paralysis of skeletal muscle
- Unmyelinated nociceptor afferent fibers relay in spinal cord where= substantia gelatinosa
- The major connection of pontine nuclei in left half of pons are with = left cerebrum and right cerebellum
- Tremors on voluntary activity lesion= Cerebellum
- A person presented to you with nystagmus and staggering gait. What else you need to do in examination to confirm the diagnosis? Pendular knee jerk
- A patient is unable to do alternate rapid movement on two hands. Likely term used is= Dysdiadokokinesia
- Patient having nystagmus, site of lesion is= Floculonodular
    - Note this for Nystagmus only ----- Floculonodular > cerebellum
    - Floculonodular is a part of cerebellum coordinates balance and eye movements
- Folia is a feature of = Cerebellum
- 60-year patient with tremors at rest. Shuffled gait, stooped posture. Lesion in= Midbrain
- Closest to Crus cerebri is= Substantia Nigra
- Basal ganglia located in= Internal capsule medial to Globus palidus
- A person with diagnosis of parkinsonism, which neurons will be damaged= Substantia nigra
- Arbor vitae is= Branching pattern in cerebellum
- Main function of cerebellum= Coordination of agonist and antagonist muscle
- Intention tremors, ataxia and Dysmetria are signs of= Cerebellum
- Middle age patient presents to you with Corse tremors. Lesion is at= Cerebellum
- Patient has a tendency to fall on left side, lesion is in= Left cerebellum lesion
- Involvement of which part of the brain is in control of direct autonomic reflexes = hypothalamus
- Which is involved in planning and organization of movements= Neurocrebellum and basal ganglia
- Which part of limbic system is involved in emotions= Cingulate gyrus
- Papez circuit in the limbic system connects which of the following= Fornix, mammillary body, thalamus and cingulate gyrus
- In cerebellar lesions which of the following sign will be present= Pendular knee jerk
    - It comes in different ways with different options
    - Remember: Dysdiadokinesia > Dysarthria> Nystagmus > Dysmetria

- One of the following is due to cerebellar lesion= Dysmetria
- What specific action to be performed to check cerebellum lesion= Dysdiadokinesia
- Cerebellar lesion characteristic= Dysmetria

30. A PERSON HAS INTENTION TREMORS. WHERE WILL BE THE LESION= CEREBELLUM

NOTE ABOUT TREMORS HINT

Parkinsonism tremor	❖ **Asymmetrical resting tremor**, as a 'pill-rolling ❖ Increased by stress or emotions ❖ Lesion in ---**Substantia nigra**
Essential tremor	❖ Postural tremor: worse if arms outstretched ❖ Improved by alcohol and rest ❖ Titubation ❖ Often **strong family history** ❖ Rx: **Propranolol**
Physiological tremor	❖ Postural tremor occurring in every normal individual. ❖ It is rarely visible to the eye and may be heightened by strong emotion (such as anxiety or fear), physical exhaustion, hypoglycemia,
Cerebellar disease	❖ **Intention tremor** occurring at the end of a purposeful movement such as touching a finger to the tip of the person's nose.
Thyrotoxicosis	❖ Usual thyroid signs e.g. Weight loss, tachycardia, exophthalmos feeling hot...
Hepatic encephalopathy	❖ History of chronic liver disease

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ A 30-years old female presents with sweating, tremors and palpitations. Examination reveals exophthalmos associated with goiter. She has raised levels of serum T4 and markedly depressed levels of TSH. She had positive antithyroid antibodies. The most likely diagnosis is= Grave's disease
- ❖ A 65-year-old man with resting tremors. The lesion is in= Substantia nigra
- ❖ A 60-year-old patient reported having rigidity and resting tremors. The histological inclusion bodies for this condition were found to be in one of the following nuclei of brain= Substantia Nigra
- ❖ A 30 years old male came with history of progressive right facial numbness and headache for 3 months. On examination, facial nerve palsy was confirmed on right side and right sided intention tremors. The most likely site of lesion is= Cerebellopontine angle
- ❖ A 70-year-old retired professor complained of tremors in his hands, which were particularly bad when he tried to perform a task. On entering the clinic, the physician observed that his gait was wide and awkward. He demonstrated past pointing when asked to perform a finger to nose test, and had difficulty in producing rapidly alternating supination and pronation movements of the hands. Which part of the motor system is most likely to be affected in this patient= Cerebellum
- ❖ Lesion in which area of the brain causes resting tremors and expressionless face= Substantia nigra
- ❖ A 54 yrs. old male went to doctor with complaint of weakness of left half of body. O/E he had tremor of left hand at end of movement. Muscular hypotonia of left limbs and tendency to fall upon left side. All cranial nerves were intact. Neurological lesion is located in= Left Cerebellar
- ❖ A person presented with postural tremor having slow progression and associated with titubation, after some rest it was relieved, the likely diagnosis is= Benign essential tremor
- ❖ A patient comes to you in neurology clinic. he was worried about his tremors in hands as he feels extreme embarrassment in public. He tells you that his father had the same disease, what is most likely Diagnosis= Benign essential tremors
- ❖ A 40-year-old teacher presents with tremors of hands. His handwriting is poorly understandable. One of his cousins has the same problem. He is neither hyperthyroid nor asthmatic. On examination, no

cogwheel or lead pipe rigidity, gait is alright and no Kayser-Fleischer rings found. What single drug among the followings would you recommend= Propranolol

331. POSTERIOR 1/3 TONGUE SENSATIONS LOST DAMAGE OF= GLOSSOPHARYNGEAL

NOTE ABOUT TONGUE SUPPLY

Nerve Supply	Motor nerves: ○ All except palatoglossus muscle by : hypoglossal nerve ○ Palatoglossus muscle: accessory nerve through pharyngeal plexus. Sensory nerves: ○ **Ant 2/3rd: (formed from 1st and 2nd branchial arches)** ▪ General sensation: lingual nerve (mandibular branch) ▪ Taste sensation: chorda tympani (facial nerve) ○ **Post 1/3rd: (formed from 3rd and 4th branchial arches)** ✓ General and taste sensation: glossopharyngeal nerve

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Taste sensation lost from anterior 2/3 of tongue which nerve is damaged= Facial nerve
- A piece of sugar is placed on the anterior 2/3 of tongue, taste sensation is carried by= Facial
- Taste sensation from post 1/3 of tongue carried by= Glossopharyngeal nerve
- Anterior 2/3 tongue has cancer. Which lymph nodes will be involved= Submandibular
  - Remember:
    - TIP of tongue- sub mental
    - Ant 2/3- submandibular
    - Post 1/3rd—upper deep cervical lymph nodes
- Taste sensation collected from tongue are= SVA
- Regarding Chorda tympani= Joins lingual nerve
- Posterior most side of tongue taste sensation goes to= Tractus Solitarius
- Taste sensation from Tractus Solitarius carried to cortex via= Thalamus
- Root of the tongue have nerve supply from which nucleus= Tractus Solitarius
- Tractus solitarus is formed by cell bodies of=Second order neurons
- The structure present in nucleus of Tractus Solitarius is= Cell bodies of 2nd order neuron in taste pathway
- Mass on left anterior 2/3 Tongue early lymph drainage to= Submandibular
- Nerve supply of anterior 2/3 of tongue= Facial nerve
- General sensation from ant 2/3 of tongue is via= Lingual nerve
- Tumor of which of the following results in involvement of submental and submandibular lymph node= Lower lip
  - It also comes as
    - Enlargement of submandibular and submental lymph node occurs in= Ca lower lip
- Sweet sensation from the Anterior 2/3rd of tongue sensation supplied by= Facial nerve
- Anterior 2/3rd of tongue taste sensation is via chorda tympani fibres of facial nerve. These fibres carrying taste sensations are= Special Visceral Afferent
- Location of geniculate ganglion=Medial wall of middle ear

332. PURKINJE FIBRES RECEIVE INPUT FROM= CLIMBING FIBRES

REMEMBER:

- Climbing fiber originate from= Inferior olive nucleus
- Parietal lobe lateral part concerned with= Somatosensory area
- Cerebellum is connected to midbrain via= Superior cerebellar peduncle
  - Note that:
    - The inferior peduncle connects the medulla to the cerebellum.

- While the superior peduncle connects the cerebellum to the midbrain.

- Closest to Crus cerebri is= Substantia Nigra

333. RETROPHARYNGEAL LYMPH NODE RECEIVES LYMPH FROM= PHARYNX

ALSO NOTE THAT.

- ✓ A PT having enlarged Jugulodiagastric nodes. Cause of node enlargement= Palatine tonsils

334. IN POSTERIOR CRANIAL FOSSA= FACIAL NERVE ENTERS THRU STYLOMASTOID FORAMEN

ABOUT FACIAL NERVE

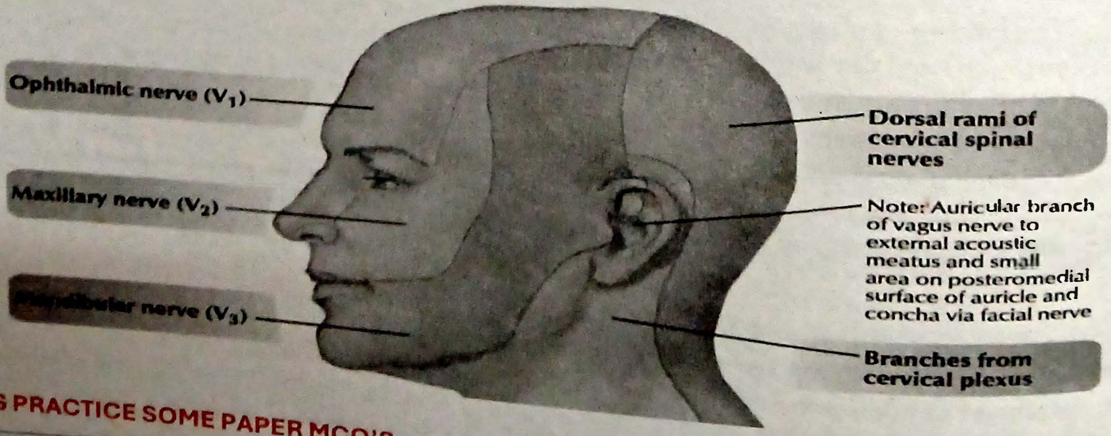
- ✓ It passes through the internal auditory meatus and the facial canal of the temporal bone before leaving the skull through
- ✓ Leaves skull by passing through stylomastoid foramen
- ✓ 7th cranial nerve, nerve of 2nd branchial arch
- ✓ Supply----------Mnemonic: imagine someone making **F**acial expression to say **PSS**...
    - Facial expression muscles
    - Posterior belly of Digastric
    - Stapedius
    - Stylohyoid

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Nerve passing through petrous of temporal bone is= Facial nerve
- Muscle supplied by facial nerve= Stylohyoid
- Cervical branch of facial nerve supplies= Platysma
- Structure which separates superficial and deep part of submandibular gland= Mylohyoid
- Nerve supply of all scalp muscle= Post auricular and deep temporal branch of facial
- Neve supply to Levator angularis oris muscle= Facial nerve
- Anterior 2/3 taste carried by= Facial nerve
- Superficial structure that lies in parotid gland= Facial nerve
- Most likely nerve to be injured in a Submandibular gland surgery is= Marginal mandibular nerve (branch of facial nerve)
- Chorda tympani joins mandibular nerve to supply preganglionic to submandibular gland. Which other muscle does this mandibular supply on its path= Tensor veli palatini

335. PATIENT PRESENTS WITH PAIN AROUND NOSE, EYE. NERVE INVOLVED IS= OPHTHALMIC NERVE

For this remember this picture


Ophthalmic nerve (V_1)
Maxillary nerve (V_2)
Mandibular nerve (V_3)
Dorsal rami of cervical spinal nerves
Note: Auricular branch of vagus nerve to external acoustic meatus and small area on posteromedial surface of auricle and concha via facial nerve
Branches from cervical plexus

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Pain in the ala of the nose along with loss of sensation between angle of mouth and orbit. Nerve involved= Maxillary division of trigeminal
- Pain from parotid carried via= Auricotemporal
- A patient has pain on side of nose and the area between mouth and orbit and temporal region. Which of the following nerve involved= Maxillary branch of trigeminal nerve

336. THE LOSS OF VISUAL ACUITY AND VISUAL FIELD IN THYROTOXIC OPHTHALMOPATHY IS MOST LIKELY DUE TO= OPTIC NERVE COMPRESSION

RELATED SCENARIO TO COMPRESSION

- A patient has dependent edema is diagnosed as having hepatoma caused by compression of = IVC
- True about Supernumerary cervical Rib= Compress brachial plexus and subclavian vessels
- Dilatation of aortic arch will compress = left bronchus
- Carpal tunnel syndrome= compression of median nerve
- Dec visual acuity in thyroid disease due to = optic nerve compression
- A fracture of first lumbar vertebra may cause compression of the= Conus medullaris
- Regarding Bell's palsy, which of the following is most appropriate= Is caused by compression at the stylomastoid foramen
- The enlargement of one of the following heart structures would most likely compress the esophagus and result in difficulty in swallowing= Left atrium
- Compression of S1 nerve root results in= Loss of ankle jerk
- Cubital tunnel syndrome due to ulnar nerve entrapment may occur as consequence of compression by one of the following muscles= Flexor carpi ulnaris
- Which of the following muscles is NOT typically affected by median nerve compression= Flexor carpi radialis
- In a roadside accident a 40-year-old man got a sharp injury and he was received in emergency with a profuse bleeding from his neck. The Senior Registrar concluded that the bleeding was from internal carotid artery. He immediately compressed the anterior tubercle of one of the following cervical vertebra to stop the bleeding= Sixth

337. REGARDING CENTRAL RETINAL ARTERY= OCCLUSION CAUSE SLOW PAINLESS BLINDNESS

Diabetic Retinopathy	• Retinal damage due to chronic hyperglycemia • Two types ▪ Nonproliferative—damaged capillaries leak blood -- lipids and fluid seep into retina –hemorrhages, macular edema & cotton wool spots ▪ Proliferative—chronic hypoxia results in new blood vessel formation
Hypertensive Retinopathy	• Retinal damage due to chronic uncontrolled HTN. • Flame-shaped retinal hemorrhages, arteriovenous nicking, microaneurysms & cotton-wool spots (Remember DM > HTN for cotton wool spots)
Retinal Vein Occlusion	• Retinal hemorrhage and venous engorgement ("blood and thunder appearance")
Central Retinal Artery Occlusion	• Acute, painless monocular vision loss. • Retina cloudy with attenuated vessels and "cherry-red" spot at fovea (center of macula) • Evaluate for embolic source.
Papilledema	• Optic disc swelling (usually bilateral) due to increase ICP (e.g., 2° to mass effect). • Enlarged blind spot and elevated optic disc with blurred margins

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Pt having 15 years of diabetes have decrease visual acuity. O/E it showed white spots and exudates on retina. Most likely due to= Central retinal vein occlusion
- Cotton wool spots on slit lamp exam of eye maybe seen in =Diabetic retinopathy
- Cotton wool patches in retina are commonly seen in=Diabetic retinopathy
- Silver and copper wiring in the retina occur in= Hypertensive retinopathy.
- Edema in retina occurs in= DM
- Characteristic retinal changes that occur in HTN are= Av nipping
- A middle aged male patient has recently developed diminished visual acuity. He has a history of chronic hypertension for 15 years. Fundoscopy showed grade III retinal changes. The most important target of hypertension in retina are= Arterioles
- A 30-year-old patient with history of recurrent headache was sent for fundus evaluation. He was found to be having generalized arterial attenuation with multiple cotton wool spots and flame shaped hemorrhages in both eyes. The most likely cause is=Hypertensive retinopathy
- An elderly male with heart disease presents with sudden loss of vision in one eye; examination reveals cherry red spot; diagnosis is= Central retinal artery occlusion
- A 60-year-old male patient operated for cataract 6 months back now complains of floaters and sudden loss of vision. The diagnosis is= Retinal detachment
- Whole of the retina except rods and cones is supplied by which vessel=Central retinal artery
- Which artery has branches that are end arteries=Central retinal artery

REMEMBER THESE AS WELL

- Pigment and neuronal layer of retina are kept in approximation by= Glycosaminoglycan
- The outermost layer of retina consists of= Pigmented epithelial cells
- Pigment cell epithelium of retina are derived from= Ectoderm
- Disorder in which light focus in front of retina instead of retina= Myopia.
- An HTN man presented with eye problems and was diagnosed as grade III HTN retinopathy. Which of following is the target of HTN in retina= Arterioles
- The first step that occurs when light falls on retina is= Reduction of 11 cis retinal to all trans retinal
- Radiation entering retina will cause damage by= Photochemical
- Hyphema is the collection of blood in= The anterior chamber of the eye
- 20-year-old is complaining of reduced far vision, Blood sugar is 300mg/dL, what could be the cause of reduced vision=Index myopia
- A 70 year old diabetic lady complains of failure to recognize faces clearly from a distance. On examination, light reflex is positive. Her intraocular pressure is normal and so are retinae. In the right eye visual acuity is 4/60 and in the left eye 3/60. The most likely cause is=Cataract
- Cycloplegic refraction can be most dangerous in patients with:=Shallow anterior chamber

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338. A 15 YEARS OLD GIRL WITH FIXED DILATED PUPILS. LESION IS AT = OCCULOMOTOR NERVE

ALSO NOTE THAT.

- Unable to close eye= facial nerve lesion
- While Unable to Open eye= Occulomotor nerve lesion
- CN III damage
    - Lesion results in absent pupillary light reflex, "blown pupil" often with "down-and-out" gaze
- CN IV damage
    - Eye moves upward, particularly with contralateral gaze (problems going down stairs, may present with compensatory head tilt in the opposite direction).
- CN VI damage
    - Medially directed eye that cannot abduct

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Scenario with ptosis, dilated pupil, eye downward and outward. Nerve involved= Occulomotor nerve damage
- Light thrown in right eye direct reflex is present but absence of indirect light reflex. Which structure is involved= Left occulomotor nerve
- Paralysis of 4th cranial nerve produces= Impaired downward gaze in adduction
- Light thrown in Rt. eye, direct reflex is present but absence of indirect light reflex. Which structure is involved/damaged = Left occulomotor nerve
- Post syphilitic pt. can't constrict pupil on light, with intact accommodation= Argyll-Robertson pupil

339. PATIENT MOVED HIS RIGHT EYE UPWARD AND TILTED HIS NECK TO LEFT TO AVOID DIPLOPIA. THE MUSCLE DAMAGED WAS= SUPERIOR OBLIQUE

FOR THIS REMEMBER THE ABOVE LESIONS AND NERVE SUPPLY AS

- Mnemonic---LR6-SO4 Rest 3
    - Lateral Rectus→ 6th (abducent) cranial nerve
    - Superior Oblique→ 4th (trochlear) cranial nerve
    - Rest all are supplied by→ 3rd (occulomotor) nerve
- Abducent nerve passes through= cavernous sinus
- A pt unable to perform Lateral movement of RT eye. Cause is= Cavernous sinus infection

340. LOSS OF ACCOMMODATION REFLEX. LESION IN= CEREBRAL CORTEX

REMEMBER THAT.

- Accommodation reflex
    - Afferent is optic nerve, efferent in oculomotor nerve
- If both direct and indirect light reflex absent lesion is in= oculomotor nerve
- Argyll Robertsonian pupil= accommodation reflex present but loss of direct and indirect reflex, seen in Multiple sclerosis, syphilis, Midbrain lesions, pretectum lesions
- Loss of accommodation reflex= cerebral cortex
- Accommodation reflex lost with 3rd cranial (oculomotor) nerve involvement= Midbrain
- Light reflex lost= Midbrain
- Corneal reflex lost= pons

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Post syphilitic pt. can't constrict pupil on light, with intact accommodation= Argyll-Robertson pupil
- Accommodation reflex due to= Ciliary muscle contraction
- Loss of accommodation reflex. Lesion in= Cerebral cortex
- Reflex involving cerebral cortex= Accommodation
- Patient with loss of accommodation reflex. On CT, lesion will be seen in= cerebral cortex
- Loss of accommodation reflex due to oculomotor nerve occurs due to lesion in= Midbrain
- Pupillary reflex lost, accommodation present. Where is the lesion =Pretectum

341. STRUCTURE PASSING THRU THE CAVERNOUS SINUS = ABDUCENT (CN 6)

REMEMBER ABOUT CAVERNOUS SINUS

Location and Drainage	The cavernous sinus is located on either side of the pituitary fossa and body of the sphenoid bone → drains into Internal jugular vein.
Contains	CN 3rd, 4th, 5th (V1, V2) and 6th cranial nerve Internal carotid artery

	❖ Facial vein and superior ophthalmic vein (note these are an important route for spread of infection from face) ❖ 6th cranial nerve is most susceptible to injury	
Cavernous Sinus Syndrome	❖ Presents with variable ophthalmoplegia, ↓ corneal sensation, Horner syndrome and occasional decreased maxillary sensation. 2° to pituitary tumor mass effect, carotid-cavernous fistula, or cavernous sinus thrombosis related to infection.	
Cavernous Sinus Vs Lateral Sinus Thrombosis	**Cavernous Sinus Thrombosis**	**Lateral Sinus Thrombosis**
	❖ Periorbital oedema ❖ Ophthalmoplegia: 6th nerve damage typically occurs before 3rd & 4th ❖ Trigeminal nerve involvement may lead to hyperaesthesia of upper face and eye pain ❖ central retinal vein thrombosis	❖ 6th and 7th cranial nerve palsies

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Infection in cavernous sinus= superior ophthalmic vein
  - It also comes as
    - Infection of the face is most likely to spread to the cavernous sinus through= Superior ophthalmic vein
    - Facial infections from the tip of the nose can spread to Cavernous Sinus via= Superior ophthalmic vein
    - Infection from danger area of face can spread to= Cavernous sinus
- Cavernous sinus thrombosis causes edema of the orbital structures by blocking one of the following structures= Superior ophthalmic vein
- A man presented with headache, furuncle on tip of nose, high fever with redness and swelling of eye and increased ICP. Diagnosis= Cavernous sinus thrombosis
- The cavernous sinus most likely= It has the oculomotor, trochlear, and ophthalmic divisions of the of the trigeminal nerve in its lateral wall.
- Emissary veins from nose will go to= Cavernous sinus
- Cavernous Sinus thrombosis lesion leads to= Decreased or absent corneal reflex
- First symptom of cavernous sinus thrombosis= Loss of abduction
- A boy had head injury after that his eye pulsate with heart beat it is due to relations= Cavernous sinus with internal carotid artery
- Occulomotor nerve related to which sinus= Cavernous sinus
- A pt is unable to turn his RT eye laterally which of following is most likely= Infection in Rt cavernous sinus
  - It also comes as
    - Inability to do lateral rotation of eye cause= Infection of cavernous sinus
- Abducent nerve passes through= Cavity of cavernous sinus
  - It also comes as
    - One of the following is the content of the cavity of cavernous sinus= Abducent nerve
    - Cavernous sinus most likely= Has internal carotid artery and abducent nerve
    - The nerve which lies within the cavity of cavernous sinus is= Abducent
    - A patient diagnosed as cavernous sinus thrombosis is found to have lateral rectus paralyzed, nerve likely to be damage is= Abducent nerve
- Which of the following sinus lies in the margin of the tentorium cerebelli, running from the posterior end of the cavernous sinus to the transverse sinus= Superior petrosal sinus.

- During surgery of the mastoid antrum, he surgeon notes profuse bleeding from the posterior wall of mastoid antrum. The source of bleeding is= Sigmoid sinus

SCENARIO ABOUT 5, 7, 8 NERVE DAMAGE. LESION IN WHICH AREA= PONS

CATION OF CRANIAL NERVE NUCLEI IN BRAIN STEM

- Contains
  - Midbrain→ 3rd and 4th cranial nerve
  - Pons → 5th, 6th, 7th, 8th
  - Medulla → 9th, 10th, and 12th

Extra Note→ Cribriform plate contains 1st cranial nerve, optic canal contains 2nd, while 11th in spinal cord

OW LET'S PRACTICE SOME PAPER MCQ'S

ERVES ASSOCIATED WITH THE PONS

- Regarding pons, which nerves arise? = Motor part of V, VI, VII
- Nerves arising from pons? = CN V, VI, VII, VIII
- Nerve arising from anterolateral surface of pons? = Trigeminal
  - Additional Details:
    - Anterolateral surface of pons = Trigeminal nerve
    - Median/medial surface of pons = Abducent nerve
    - Between these two = Facial (VII) and Vestibulocochlear (VIII) nerves

OPTIC NERVE (CN II)

- Anterior pituitary tumor will compress? = Optic nerve
- If pituitary tumor grows anteriorly, it compresses which nerve? = Optic nerve
- 1st route of spread of retinoblastoma out of optic cavity? = Optic nerve

OCULOMOTOR NERVE (CN III)

- Scenario of dilated pupil, ptosis, eyeball downward and outward. Lesion at? = Oculomotor
- A young girl of 20 years came to OPD with a fixed and dilated left pupil. This is most likely due to damage to? = Inferior branch of Oculomotor nerve

TRIGEMINAL NERVE (CN V)

- Which cranial nerve nuclei lie lateral to sulcus limitans? = Trigeminal
- Pain from the meninges of the middle cranial fossa is transmitted by? = Trigeminal ganglion
- Dura is supplied in the middle cranial fossa by? = Trigeminal
- Sensory supply of the scalp? = Trigeminal

FACIAL NERVE (CN VII)

- Patient with decreased salivation, submandibular damage. Which nerve is damaged? = Facial nerve
- Lacrimation during eating. Which nerve is involved? = Facial
- While making a skin incision for sub-mandibular salivary gland, which nerve is likely to be damaged? = Marginal mandibular nerve

VAGUS NERVE (CN X)

- Cough reflex afferent fiber through? = Vagus
- Nerve involved in the cough reflex? = Vagus
- Death is caused by bilateral damage to which nerve? = Vagus
- A patient presented with nausea, vomiting, and vertigo. This is associated with? = Dorsal nucleus of vagus with vestibular nucleus
- A patient presented with nausea, vomiting, and vertigo. Lesion is associated with? = Dorsal nucleus juxtaposed to vestibular nucleus

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HYPOGLOSSAL NERVE (CN XII)

- A patient presented with a lesion of the right hypoglossal nerve. = Tongue deviates towards the right wi atrophy
- Which of the following nerves is composed entirely of efferent fibers? = Hypoglossal
- Thyrohyoid muscle nerve supply? = C1 through hypoglossal nerve

OTHER NERVES

- In children, the risk of nerve damage during IV line insertion? = Saphenous nerve
- Plastic surgeon performing surgery turns a flap in the middle of the forehead at the vertex. Which structure is likely to be damaged? = Supratrochlear nerve
- Patient has midline forehead trauma. Damage will most likely be to? = Supratrochlear nerve
- Eyes looking downward. Lesion in? = Midbrain

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343. VOMITING CENTER LOCATED IN= MEDULLA

NOTE THAT

- Vomiting center located in= Medulla
- Cough center is present in= medulla
- Respiratory center located in= Medulla oblongata

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344. SUPERIOR COLLICULUS RECEIVES WHICH SENSATION = VISUAL

NOTE

- Superior colliculi—conjugate vertical gaze center.
- Inferior colliculi— auditory.
  - ✓ MNEMONIC: **Your eyes are above** (superior colliculus (visual) **your ears** (inferior colliculus (auditory)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Superior colliculus associated with= Vision
- Superior colliculus is compressed. It will affect eye muscles and cause what= Contralateral saccades
- Oculomotor somatic nucleus is found at the level of? = Midbrain superior colliculus
- Posterior to the cerebral aqueduct in the midbrain lies the = Colliculus
- Ahmed was sitting in a dark/light room & suddenly turns his head towards door or in direction in which he perceive/felt someone has passed in that direction. This is due to = Inferior colliculus
- Reflex vision stimulates? = Superior colliculus

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345. WHICH OF THE FOLLOWING STATEMENTS IS CORRECT REGARDING CSF= REABSORBED BY ARACHNOID VILLI

REMEMBER

- The CSF occupies the subarachnoid space

FORMATION AND CIRCULATION OF CSF

- CSF is made by ependymal cells of choroid plexus
- it is reabsorbed by arachnoid granulations
- Drains into Dural venous sinuses.
- Majority of CSF is produced from within the two lateral ventricles
- From lateral ventricles $\xrightarrow{\text{Foramina of Monro}}$ 3rd ventricle
- From 3rd ventricle $\xrightarrow{\text{cerebral aqueduct of Sylvius}}$ 4th ventricle
- From 4th ventricle $\xrightarrow[\text{Foramina of Magendie—Medial}]{\text{Foramina of Luschka—Lateral}}$ into subarachnoid space

NOW LET'S PRACTICE SOME PAPER MCQ'S

CSF PROPERTIES

- What is the normal CSF pressure= 10 to 20 cm of water
  - It also come this way—note the difference between units
    - Normal CSF pressure is= 7-15 mmHg
- What is the CSF specific gravity= 1.005 to 1.009
  - CSF density = 1.00059
  - While CSF specific gravity= 1.005-1.009
- Daily production of CSF= 450mL
  - (CSF production is approximately 20 mL per hour. Literature review current through: May 2019-UpToDate)
  - Range is 450-500Ml
  - It also comes as
    - Regarding cerebrospinal fluid, the most appropriate statement is? = Is formed at a rate of approximately 500 milliliters each day
- CSF volume at a given moment? = 150 mL
- In normal conditions, does cerebrospinal fluid have? = A pressure of 10 mmHg
- A routine examination of CSF in a healthy individual is likely to show? = Protein levels of 20-40 mg/dL
- CSF protects the brain from injury by? = Cushioning and buoyancy effects

FORMATION, ABSORPTION AND CIRCULATION OF CSF

- Cerebrospinal fluid is formed by? = Ependymal cells
- The first step in CSF formation? = Ultrafiltration of Na
- CSF flows from? = Third to fourth ventricle
  - It also comes with different options
    - CSF flow through? = Magendie foramen to subarachnoid space
    - Regarding CSF circulation, which one is correct? = Foramina of Magendie to subarachnoid space
    - CSF drainage occurs through = Foramen of Luschka to spinal fluid
    - True about CSF circulation? = Occurs from Foramen of Magendie with Subarachnoid
- Hydrocephalus is characterized by an abnormal accumulation of CSF within the ventricular system. Most commonly due to obstruction of? = Aqueduct of Sylvius
- CSF is released into the subarachnoid space at the? = Medial aperture of the fourth ventricle
- About the 3rd and 4th ventricles, true is? = Communicates through cerebral aqueduct
- CSF absorption occurs in? = Arachnoid granulations
- CSF drain into = Dural venous sinus
- CSF present in which space? = Subarachnoid space
  - It also comes with different options
    - Main site of cerebrospinal fluid absorption is? = Superior sagittal sinus
    - CSF is absorbed from? = Arachnoid villi
    - The main site of absorption of CSF is the arachnoid villi projecting into? = Superior sagittal sinus
    - The main site of absorption of cerebrospinal fluid are the arachnoid villi projecting into one of the following dural venous sinuses= Superior sagittal
    - Arachnoid granulations maximum drainage Into= Superior Sagittal sinus

CSF OBSTRUCTION AND RELATED PATHOLOGY

- In hydrocephalus, most common obstruction occurs at? = Aqueduct of Sylvius
- In cerebral aqueduct obstruction, what structure will be dilated first? = 3rd ventricle
- Cerebral aqueduct stenosis causes increased pressure in which ventricle? = 3rd ventricle

- RT lateral ventricle dilated. Where will be the blockage? = Foramen of Monro
- Aqueduct of Sylvius connects? = 3rd and 4th ventricles
- What lies posterior to cerebral aqueduct in midbrain? = Colliculus

OTHERS

- The unlikely feature concerning CSF is? = CSF in the central canal of the spinal cord is unable to enter the fourth ventricle
- One of the following is NOT a feature of the CSF? = The valve action of the arachnoid villi closes when CSF pressure rises
- To drain CSF from a hydrocephalus fetus, the needle is inserted into the? = Posterior fontanelle
- A primigravida presented in labor for 2 hours. USG reveals a dead hydrocephalus fetus at -2 station. Where should the gynecologist insert the needle to drain CSF? = Posterior fontanelle
- Variations in which of the following components of blood or CSF do not affect respiration? = Arterial Na^+ concentration
- Basic mechanism involved in aqueous humor production? = Active sodium secretion
- Ascending reticular formation located in? = Floor of aqueduct of Sylvius
- In spinal tap, CSF was blood-stained. What will be the diagnosis? = Subarachnoid hemorrhage
- A patient presented to ER in a state of severe headache and vomiting, on LP blood was present in CSF. The most probable diagnosis is? = Subarachnoid hemorrhage

346. WHICH IS LOW IN CSF AS COMPARE TO PLASMA = PROTEIN

- **REMEMBER COMPARISON OF CSF WITH PLASMA**

CSF=Blood	CSF < Blood	CSF > Blood
Na^+, Cl^-, HCO_3^-	K^+, Ca^{2+}	Mg^{2+}
Osmolarity	Glucose, Cholesterol. Protein, pH	Creatinine

NOW LET'S PRACTICE SOME PAPER MCQ'S

- True about CSF= Slightly acidic than plasma
- CSF compared to plasma has= Decreased pH
- As compared to plasma, CSF has= Decreased protein (prefer Decreased protein > Decreased glucose)
- True about CSF is=Dec glucose than plasma
- CSF osmolality is more than plasma due to=Low glucose
- CSF differs from plasma in? = Decreased pH
- CSF differs from plasma in having? = Lower glucose
- Laboratory examination of CSF obtained from a normal individual reveals? = Glucose content lower than the plasma
- The concentration of which is less in CSF compared to plasma? = Proteins

347. WITHDRAWAL OF CEREBROSPINAL FLUID NEEDLE MOVES IN THROUGH = EPIDURAL → DURA → SUBDURAL

- **NOTE → IT MOVES THROUGH THE FOLLOWING**
    - Skin --> Fascia and subcutaneous fat --> Supraspinous ligament --> Interspinous ligament --> Ligamentum flavum --> Epidural space and fat (epidural anesthesia needle stops here) --> Dura --> Subarachnoid space

NOW LET'S SOLVE SOME PAPER MCQ'S

LUMBAR PUNCTURE (LP)

- Site of Lumber puncture= Below L4
- Ideal site for LP= Above L5
- The most common site for lumbar puncture is? = L4-L5
  - Note: "Kaplan" and First aid Says L4-L5 while other 3 sources including Davidson says L3-L4 is most common site. I am with L4-L5, even though L3-L4 is also right.
- During LP after crossing flavum at L3, L4, the needle touches which structure first? = Epidural space
- Structure most likely pierced by the needle during lumbar puncture? = Dura mater
  - It also comes with different options
    - During LP, structure pierced to reach the epidural space? = Ligamentum flavum
    - Structure most likely pierced by needle during lumbar puncture? = Ligamentum flavum
    - Ligament pierced last during epidural is? = Ligamentum flavum
    - Which of the following structure is pierced in paramedian approach? = Ligamentum flavum
- In order to withdraw cerebrospinal fluid, a needle tip must pass successively through? = Epidural space, dura mater, subdural space, and arachnoid membrane
- A young man was brought to the emergency department with a temperature of 101°F. On examination, there was neck rigidity. While performing lumbar puncture, the ideal space is? = Above the spine of L4 vertebra

EPIDURAL SPACE

- The spinal epidural space most likely contains? = Venous plexus
- Regarding epidural space extension? = Foramen magnum to S2
- The widest part of the epidural space in adults is? = Lumbar L2 level
- Site of epidural anesthesia for a patient undergoing vaginal hysterectomy? = Sacral hiatus
- In epidural anesthesia for vaginal hysterectomy, the needle enters through? = Sacral hiatus
- Spinal cord is suspended in dura by? = Denticulate ligament

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348. MAN MOVING DOWN IN ELEVATOR = SACCULE

REGARDING VESTIBULAR SYSTEM

- Semicircular canals, → detect angular acceleration (rotation)
- Utricle→ linear horizontal acceleration
- Saccule→linear vertical acceleration

NOW LET'S SOLVE SOME PAPER MCQ'S

- A person travelling in the bus when the bus suddenly was stopped. Most important in preventing the person from falling is= Utricle
- A bus moving in horizontal direction stopped suddenly, man will remain steadfast by= Macula of the utricle
- Man moving up in elevator, balance by= Saccule
- Semi-circular canals in cortex of ear are maximally stimulated= Doing cartwheel
- Semi-circular canal stimulated to right in= When the head tilts to right

---

349. DURING WHICH STAGE OF SLEEP DO THETA WAVES APPEAR ON THE EEG = STAGE 1 NREM

Awake (Eyes Open)	**B**eta waves
Awake (Eyes Closed)	**A**lpha waves
Non- REM Sleep (Stage-1 Light Sleep)	**T**heta waves
Non- REM Sleep (Stage-2- Deep Sleep)	**D**elta waves
REM Sleep	**B**eta waves

Mnemonic:
At night, **BAT D**rink **B**lood

NOW LET'S SOLVE SOME PAPER MCQ'S

- ❖ Deep sleep is characterized by= Delta waves
- ❖ About N-REM what is true= Synchronization of Delta waves occurs
- ❖ A person is awake with eyes close= Alpha Waves
- ❖ Theta waves are seen in which phase of Sleep= Non-REM stage 1
- ❖ Alpha waves totally absent and beta present in a patient EEG. Cause= Alert and wakeful
- ❖ Low voltage/amplitude Beta waves are seen on EEG during= Active mentation/thinking
- ❖ A young man fully relaxed and alert sitting on a chair in a dark room with eyes closed. Which wave will be seen in EEG= Alpha
- ❖ Alpha waves on EEG= disappears when eyes are opened
- ❖ The EEG of an anesthetized patient will show=Low frequency

350. REM SLEEP CHARACTERIZED BY= LOSS OF MUSCULAR TONE

351. ABOUT REM SLEEP= NIGHTMARES OCCUR

Non-REM (75%)	REM (25%)
In non-REM sleep following occurs ❖ Sleepwalking ❖ Night terrors ❖ Bedwetting ❖ Bruxism	Most dreams occur during REM sleep. REM sleep is characterized by ❖ Eye movements ❖ Loss of muscle tone ❖ Pupillary constriction ❖ Penile erection. ❖ Nightmares ❖ ↑ ACh
	Depression ↑ total REM sleep
	Alcohol, benzodiazepines, and barbiturates Norepinephrine ↓ REM sleep.

352. MICTURITION REFLEX CONTROLLED BY=PARASYMPATHETIC SYSTEM

NOTE ABOUT MICTURITION REFLEX ARC

- ❖ Bladder full→ stretch receptors stimulated→ excites parasympathetic fibers→ relay information to sacral segments of spinal cord→ relayed to two different sets of neurons
    - o Parasympathetic excited and contract detrusor muscle and internal sphincter opens
    - o At the same time somatic motor neurons supplying external sphincter via pudendal nerve are inhibited allowing the external sphincter to open and urine to flow out

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ Voluntary inhibition of micturition is by=Increase firing in pudendal nerve
- ❖ Micturition reflex is integrated in=Sacral segments of spinal cord
- ❖ Micturition reflex is voluntary inhibited by a person through=Activation of pudendal nerve
- ❖ Micturition reflex controlled by=Parasympathetic system

353. SECRETORY HORMONES FROM NEUROHYPOPHYSIS ARE STORED IN=NERVE ENDING

AND

- ❖ Supporting cell of par nervosa is= Pituicytes
- ❖ Neurosecretory hormone is released from= Nerve endings

354. THYROCERVICAL TRUNK BRANCH → SUPRASCAPULAR ARTERY

REMEMBER BRANCHES OF SUBCLAVIAN ARTERY

- ▪ Mnemonic: **V**ery **I**nteresting **T**hing **I** **S**erved **T**he **C**ountry **S**ince **D**at (that) **D**ay

- **V:** Vertebral artery
- **I:** Internal thoracic artery
- **T:** Thyrocervical trunk
    - **I:** Inferior thyroid artery
    - **S:** Suprascapular artery
    - **T:** Transverse cervical artery
- **C:** Costocervical artery
    - **S:** Superior intercostal artery
    - **D:** Deep cervical artery
- **D:** Dorsal scapular artery
- Also remember that The thyrocervical trunk is a branch of the subclavian artery arising from the first portion of this vessel

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Main artery of subclavian which takes part in shoulder joint anastomosis= Thyrocervical
- Ligation of Thyrocervical trunk. Area still perfused due to= Superior thyroid
- Inferior thyroid artery is a branch of= Thyrocervical trunk
- Which of the following is a branch of thyrocervical trunk= Inferior thyroid artery
- Deep cervical artery is branch of= Costocervical artery
- True about Thyrocervical trunk= Suprascapular artery (is a branch)
- Thyrocervical trunk branch of= Subclavian artery
- Inferior Thyroid artery is branch of=Thyrocervical trunk

MUSCULOSKELETAL

355. PATIENT WITH BONE PAINS HAVING NORMAL CALCIUM, INC. ALKALINE PHOSPHATASE MOST LIKELY SUFFERING FROM = PAGET'S DISEASE

REMEMBER

- Osteopetrosis= Failure of normal bone resorption due to defective osteoclasts → thickened, dense bones that are prone to fracture.
- Rickets= Vitamin D deficiency in children
- Osteomalacia= Vitamin D deficiency in adults
- Osteoporosis = Characterized by a decrease in bone mass/bone density, Normal bone mineralization and lab values (serum Ca2+ and PO4-)

ALSO NOTE THAT

Disorder	Serum Ca2+	PO_4^{3-}	ALP	PTH
Osteoporosis	---	---	---	---
Osteopetrosis	---/↓	---	---	---
Paget disease of bone	---	---	↑	---
Primary hyperparathyroidism	↑	↓	↑	↑
Secondary hyperparathyroidism/ CRF	↓	↑		↑
Osteomalacia/Rickets	↓	↓	↑	↑

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

HYPERPARATHYROIDISM AND RELATED CONDITIONS

- A woman of 45 years of age presented with a fracture neck of femur. Serum Ca is 12.1 – (Normal 8.5-10.2 mg/dL). What is the most likely cause = Hyperparathyroidism
- A 65-year-old patient with low serum Ca, high phosphate, high PTH, and osteomalacia. Cause = Chronic Renal Failure (CRF)
- A 60-year-old c/o pain in upper arms for 6 months. Examination unremarkable except decreased range of motion of arms. Labs: CBC normal, Na-K levels normal, Ca 7.8 (Normal 8.5-10.2 mg/dL), phosphate 6.4 (normal 2.5-4.5 mg/dL), total proteins 6.2 (normal 6-8.3 g/dL), albumin 4, creatinine 7.8. What's your diagnosis = Parathyroid hyperplasia (secondary hyperparathyroidism)

OSTEOPOROSIS

- Most common cause of multiple fractures in adults = Osteoporosis
- A patient on long-term steroid therapy most probably has an increased risk of = Osteoporosis and fractures
- Multiple fractures are commonly observed in an adult who is suffering from = Osteoporosis
- The cause of osteoporosis in a 60-year-old male is = Endocrinology disturbance/hormonal insufficiency
- A 59-year-old woman with a family history of ischemic heart disease and breast cancer, concerned about osteoporosis prevention, should be managed with = Raloxifene (SERM)
- Regarding osteoporosis, which is correct = Thin and wide trabeculae
- Osteoporosis shows which of the following lab values = Normal PTH

- Normal levels of parathyroid hormone are found in = Osteoporosis

BONE DISORDERS AND DEFICIENCIES

- Osteopetrosis causes increased bone density and brittle bones due to = Defect in osteoclasts
- In osteopetrosis, defective cells are = Osteoclasts
- An 18-year-old boy presents with a radial fracture, multiple other bone fractures, and blue sclera. Diagnosis = Osteogenesis Imperfecta
- Rickets is caused due to deficiency of = Vitamin D
- A 5-year-old child weighing 10 kg, height 167 cm presented with bowing of legs. Most likely cause is = Deficiency of Vitamin D

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356. THE CELLS OF THE BONE WHICH ARE RESPONSIBLE FOR THE MAINTENANCE AND INTEGRITY OF THE BONE MATRIX ARE= OSTEOCYTES

OsteoBlasts	Osteocytes	Osteoclasts
Bone forming cells, causes mineralization via ALP.	These are mature bone cells, derived from osteoblasts	Dissolves bone/ resorption of bone causing bone remodeling
	Lie within lacuna	Located in shallow grooves called Howship's lacunae
Growth hormone increases osteoblastic activity Glucocorticoids decreases osteoblastic activity		

Causes of osteoporosis

- Steroids
- Post-menopausal (Due to Dec. Estrogen) ---**most common cause**
- Hyperparathyroidism
- Kidney disease

NOW LET'S PRACTICE PAST PAPER MCQ'S

BONE CELL FUNCTIONS AND CHARACTERISTICS

- Cells which help in formation of bone and matrix = Osteoblasts
- The cells of the bone which are responsible for the synthesis of new matrix and fibers are called = Osteoblasts
- The enzyme that increases osteoblastic activity = Alkaline phosphatase
- Osteoclast is inhibited by = Calcitonin
- Howship lacunae contains = Osteoclasts
    - It also comes as:
        - Regarding Osteogenesis, which is correct = Osteoclasts in Howship lacuna
- - Which one of these bone cells has a different origin = Osteoclast
    - It also comes as:
        - Which of the following cell has a variable life = Osteoclast
        - Which amongst these is functionally different than the others = Osteoclast
        - Remember: Osteoblasts and osteocytes are mesenchymal in origin, while osteoclasts are derived from hematopoietic lineage

BONE REMODELING AND METABOLIC ACTIVITIES

- Which bone cells are related to bone remodeling = Osteoblasts plus osteoclasts
- Regarding Osteogenesis, which is correct = Osteoblasts secrete alkaline phosphate
- Increased osteoclastic activity, fracture, lytic lesion, hormone responsible = PTH
- Which hormone causes osteoclasts to resorb bone = PTH

ONE STRUCTURE AND GROWTH

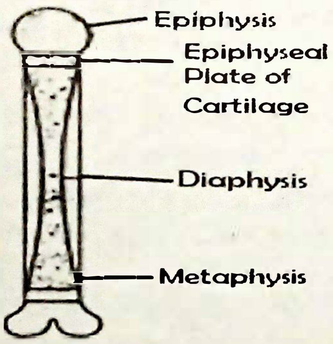
- About bone = Newly laid uncalcified bone matrix is called osteoid
- About bone = Appositional growth
- Regarding compact bone = Circumferential lamella form osteon
- Regarding compact bone = Lamella are arranged in regular fashion

ATHOLOGICAL CONDITIONS, ENZYMES AND RISK FACTORS

- Common cause of osteoporosis = Post menopause
- A 45-year-old post-menopausal female insulin-dependent DM patient with uncontrolled DM presented with a fracture, and on X-ray osteoporosis is seen. Cause was = Decreased estrogen
- Prostate carcinoma patients show metastatic lesion in = Osteoblast
- The enzyme that increases osteoblastic activity = Alkaline phosphatase
- Conversion of chondrocytes to osteocytes caused by = Growth hormone (thyroid and growth hormone both cause conversion of chondrocytes to osteocytes)

WHICH IS THE SECONDARY OSSIFICATION CENTER FOR BONE FORMATION = EPIPHYSIS

- ✓ Note that primary ossification center is diaphysis----Shaft of bones
- ✓ While secondary ossification center appears in the epiphyses----end of long bones



OW LET'S SOLVE SOME PAPER MCQ'S

- The part of developing long bone which develops after birth from a secondary center of ossification is called= Epiphysis
- Primary center of ossification at birth is present at which site=Diaphysis
- Secondary ossification center at birth first present in which of the following sites=Distal femur
    - It also comes as
        - At birth in a full-term baby, epiphyseal ossification centers are always present at the= Distal end of femur
- Secondary ossification center= Epiphysis

MUR OSSIFICATION AT= 34 WEEK

THESE MCQS ABOUT OSSIFICATION

- Humerus primary ossification starts in which week= 8 week
- Bone with 2 ossification centres= Mandible
- Ossification of the sternum body occurs at the age of=21 years
- Which of the following bones develop by Intramembranous ossification=Clavicle
- Radial Head = 3 years
- Medial epicondyle = 5 years
- Lateral Epicondyle =11 years
- hiopubic ramus fusion at = 7 years
- ral bone fuse with ilium at age = 26 years

- Ossification of parietal bone, which part is last to ossify= Angle
    - Ref: Gray's anatomy
    - The parietal bone is ossified in membrane from two centres, which appear one above the othe at the
    - the angles are consequently the parts last formed, and it is here that the fontanelles are found
- Ossification of the sternum body occurs at the age of=21 years
- The first bone of the body in an embryo to begin ossification is=Clavicle
- An 11 year old girl is referred to the radiology department for X-ray elbow joint for the assessment of bone age. The secondary centre of ossification last to appear in her humerus is=The centre for the lateral epicondyle
- Ossification process Is=usually carried out at multiple centers in individual bones
- Hyaline cartilage=Is precursor of intracartilaginous ossification
- Mature bone contains major component of=Ca hydroxyapatite
    - Almost 70% of bone is made up of bone mineral called hydroxyapatite.

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359. EWING SARCOMA OCCURS WHICH SITE OF BONE = DIAPHYSIS

REMEMBER GEOMED MNEMONIC FOR LOCATION.

- **G**iant cell --- **E**piphysis
- **O**steosarcoma/ Osteochondroma --- **M**etaphysis
- **E**wing sarcoma --- **D**iaphysis

NOW LET'S SOLVE SOME PAPER MCQ'S

- Most common primary malignant bone tumor= Osteosarcoma
- Tumor involved metaphysis of bone it was= Osteosarcoma
    - know this
        - The most common tumor of bone in the epiphysis during young age is = Osteosarcoma
- Most common malignant tumor of bone in second decade of life= Osteosarcoma
- Most common benign tumor of bone= Osteochondroma
- A 20-year female presented with proximal tibial swelling. On radiology both epiphysis and metaphysis were involved. Histology showed multinucleated giant cells. What is the likely diagnosis= Giant cell tumor
- Most common carcinoma of diaphysis is= Ewing sarcoma
- Ewing sarcoma occurs due to chromosomal translocation in= 11:22
- In an epidemiologic study, "fallout" from nuclear bomb testing and from nuclear power plant disasters is observed to have released radioactive isotopes into the environment. One of these isotopes is found to be strontium-90. It is observed that the strontium-90 in soils goes into the food chain and eventually contaminates milk products. This contamination is most likely to increase the risk for which of the following neoplasms= Osteosarcoma
    - It also comes as
        - Strontium 90 released from atomic bombs is notorious for causing= Osteosarcoma
- A child having retinoblastoma was on radiotherapy, during treatment another tumor raised in lower limb, the possible arises tumor in presence of retinoblastoma is= Osteosarcoma
    - Association of Retinoblastoma and Osteosarcoma is well established.

---

360. THE RADIOLOGICAL APPEARANCE OF GIANT CELL TUMOR IS= SOAP BUBBLE APPEARANCE

REMEMBER:

- Onion skin appearance ---------------------------- Ewing's sarcoma
- Honeycomb appearance ------------------------- Adamantinoma.
- Soap bubble appearance ----------------------- Osteoclastoma

- Codman's triangle ------------------------------------ Osteosarcoma
- Sun ray appearance ---------------------------------- Osteosarcoma
- Chicken wire pattern -------------------------------- Chondroblastoma
- Linear Striations --------------------------------------- Vertebral Hemangioma
- Cotton wool/Ground Glass Appearance------ Fibrous Dysplasia

NOW LET'S SOLVE SOME PAPER MCQ'S

- 15-year-old boy presented with a mass in the distal femur. X-ray from the lesion showed features of Codman's Triangle and Sun ray appearance. The diagnosis is most likely to be= Osteosarcoma
- Soap bubble appearance on X-ray suggest which of the following= Giant cell tumour
- Patient with painless maxillary swelling. On radiology a radiolucent, radio-opaque lesion with ground glass appearance is seen. The likely diagnosis is= Fibrous dysplasia
- A 14-year-old high school football player developed pain in his right leg. An x-ray showed a 1cm sharply demarcated radiolucent lesion in the diaphysis of the tibia surrounded by dense sclerotic bone. The most likely diagnosis is= Osteoid osteoma
- Most common primary bone tumor in the second decade is = Osteosarcoma
- Radiological appearance of giant cell tumor is = Soap bubble appearance
- A 20-year-old female with proximal tibial swelling involving epiphysis and metaphysis, histology shows giant cells indicating = giant cell tumor

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361. OLD WOMAN WITH SWELLING ON EXTERNAL EAR SHE ALSO HAD GOUT WITH –IVE BIFREGNANTTYPE CRYSTALS SCENARIO WAS GIVEN = MONOSODIUM URATE

REMEMBER

Gout	Pseudogout or Calcium Pyrophosphate deposition disease
	❖ Mnemonic –Blue P's—blue (when Parallel), Positive birefringence, calcium Pyrophosphate, Pseudogout
❖ Crystal deposition disease, characterized by deposition of monosodium urate crystals into joints and other tissues	❖ Crystal deposition disease, characterized by deposition of calcium pyrophosphate deposition crystals within articular cartilages
❖ Most common site→ 1st metatarsophalangeal joint (podagra)	❖ Most common site→ Knee
❖ Crystals→ needle like, negative birefringent	❖ Crystals→ rhomboid shape, positive birefringent
❖ Treatment ❖ acute attack→ NSAIDS, Colchicine, steroids ❖ Chronic attack→ Allopurinol (should not be used in acute attack), Febuxostat	❖ Treatment ❖ NSAIDS, Colchicine, steroids ❖ Prophylaxis (colchicine)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- A 50-year man is awakened in the middle of the night with acute pain & tenderness of the right knee. He has a low-grade fever. His knee is hot, tender & swollen. Analysis of fluid from right knee shows: leukocytes 70,000/mm3 with 75% neutrophils, crystal analysis shows negative birefringent, gram stain: negative. The most likely diagnosis is= Acute Gout

- A lady presented with swollen 1 metatarsophalangeal joint. The swelling is tender and red. She also complains of soft swelling at knee 2 weeks back. She also gives history of 2 similar episodes within 6 months. Which investigation is helpful to make the diagnosis=Uric acid level
- A 51-year lady presented with pain and swelling ankle joint with no history of trauma. Serum uric acid levels are high. Which test should be done next to confirm diagnosis= Microscopy of joint fluid for monosodium urate crystals
- A 50-years old lady presents with markedly inflamed and painful right big toe. Physical examination reveals small nodules on patient's external ear. Aspiration of metatarsophalangeal joint of affected toe demonstrated needle-shaped birefringent crystals. These crystals are most likely composed of= Monosodium urate
- Specific appropriate diagnosis of primary gout is by=Urate crystals in the joints
- A patient with spontaneous pain in big toe and loss of movements of metatarsophalangeal joint. What test should be done to diagnose the disease= Synovial fluid analysis
- 51 years old well fed male developed swelling of right big toe. there was no history of trauma. the most appropriate investigation would be=Plasma uric acid
- DOC for acute gout=NSAID
    - High-dose NSAIDs (e.g., indomethacin) are first line.
    - Colchicine may also be used but is inferior to NSAIDs.
    - Steroids are used when NSAIDs are ineffective or contraindicated, as in renal disease
- MOA of Allopurinol= Xanthine oxidase inhibitor
- What can mask the effects of allopurinol= Increased levels of albumin
- Which of the following interacts with the pharmacodynamics of Allopurinol=Albumin
- End product of purine metabolism is= Uric acid

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362. SYSTEMIC LUPUS ERYTHEMATOUS TYPICAL SCENARIO, INVESTIGATION= ANTI-DSDNA

REMEMBER

Autoantibody	Associated Disorder
Antimitochondrial antibodies (AMAs)	Primary biliary cirrhosis (female, cholestasis, portal HTN)
Antimicrosomal and anti-thyroglobulin antibodies	Hashimoto thyroiditis
Anti-transglutaminase/anti-gliadin/anti-endomysial antibodies	Celiac disease (diarrhea, weight loss)
Anti-ACh receptor	Myasthenia gravis
Anticardiolipin, lupus anticoagulant	antiphospholipid syndrome
Anti-SSA, anti-SSB (anti-Ro, anti-La)	Sjogren syndrome
Anti-histone	Drug-induced lupus
Anti-smooth muscle	Autoimmune hepatitis type 1
Anti-Ro	Sjogren's syndrome, SLE, congenital heart block
Anti-La	Sjogren's syndrome
Anti-Jo 1	Polymyositis
Anti-Scl-70	Diffuse cutaneous systemic sclerosis
Anti-Centromere	Limited cutaneous systemic sclerosis

NOW LET'S PRACTICE SOME PAPER MCQ'S

SJOGREN

- A female complains of pain and dryness of eyes, dry mouth and parotid swelling, dysphagia. CXR shows fibrosis of lungs. Diagnosis= Sjogren syndrome

- Keratitis and dry mouth= Sjogren
- A 55-year female presents with 4 months' history of blurring of vision and itching on both the eyes. She also complains of dysphagia and dryness of mouth. O/E she has B/L parotid swelling and fibroid mouth fissures. CXR shows pneumonitis. The most likely diagnosis is=Sjogren syndrome
- Pt has Xerostomia, keratitis, dry eyes. Diagnosis=Sjogren
- Female with dry eye and dry mouth= Sjogren syndrome
- Sjogren syndrome associated with= RA
- A young woman complains of dry mouth and dry eyes. Which investigation will give clue to her diagnosis=Anti SSA
- A female presented with dry mouth, dry eyes and anti SS-A and ANA positive. Which of the following is most dangerous long-term complication=Pulmonary interstitial fibrosis

SYSTEMIC SCLEROSIS

- A 35 years old female presents with 6-month Hx of fingers turning pale in cold (Raynaud's phenomenon) also having mild dyspnea with no wheeze, B/L pleural effusion, creatinine was high, urea also raised, ANA positive. What is the diagnosis= Progressive Systemic Scleroderma
- Dysphagia occurs in= Scleroderma
- Old lady difficulties in swallowing, bruises skin, poor lady can't type on keyboard= Crest syndrome

OTHERS

- A female pt developed proximal symmetrical muscle weakness, power of 3/5 and Anti-Jo Antibodies were positive. What other feature is most likely associated with it=Skin Rash
- Recurrent Abortion test that should be done= Lupus anticoagulant
- Investigation for primary biliary cirrhosis= Anti-mitochondrial antibody
- A woman has presented with dysphagia which is worsening for 3 months. Now it is difficult for her to swallow pudding. On examination of the neck surgeon notices enlarged lymph nodes on the side of her neck. What is the cause= Ca Esophagus
- Phospholipid cardiolipin present in= Mitochondrial Membrane
- Autoimmune pancreatitis occurs due to= IgG
- A 22-year-old female is found to have hematuria and proteinuria on urinalysis. She is not complaining of dysuria, abdominal pain, or any other urinary symptoms. On examination, her face appears cachectic, her buccal fat pads are absent, and her eyes appear sunken. Which of the following is the most likely diagnosis? = Lupus Nephritis
- A 35-year-old female with a butterfly malar rash and positive ds-DNA presents with proteinuria and impaired renal function. The most likely renal lesion is: = Lupus nephritis

363. GIRL WITH BUTTERFLY RASH (SLE), INITIAL MOST SENSITIVE TEST IS=ANA

REMEMBER:

Antinuclear antibodies (ANA)	Sensitive, not specific
Anti-dsDNA antibodies	Most Specific, poor prognosis (renal disease)
Anti-Smith antibodies	Specific, not prognostic
Antihistone antibodies	Sensitive for drug-induced lupus (eg. hydralazine, procainamide)
↓C3, C4	Formation of complexes leads to consumption of complement
Anti-RO antibodies	Congenital heart block

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Most specific test for diagnosis of SLE= Antibody to double stranded DNA (Remember anti-dsDNA antibodies > Anti-smith antibodies)
- Most sensitive test for SLE is=ANA
- A long scenario on SLE and in the end asked what test u will order for screening= ANA

- The fundamental defect in SLE is= Failure of B and T cells for tolerance to self-antigens
- Low complement level seen mainly in=SLE
- A Girl presented with Butterfly Rash, joint pain and hx of abortion. Most likely diagnosis is= SLE
- A lady who got rash on face after going in sun. The biopsy of lesion shows IgG with surrounding area clear. No other abnormality. ANA +ve. What is the cause=Discoid SLE
- Antinuclear antibodies may be found in which of the following conditions=Systemic lupus
- A 23-year-old woman has had worsening malaise along with a malar skin rash persisting for 3 weeks. On physical examination, she has an audible friction rub on auscultation of the chest, along with a faint systolic murmur. An echocardiogram reveals small vegetation on the mitral valve and adjacent ventricular endocardium. Laboratory studies show a positive serologic test for anti-Smith antibody and ANA. Which of the following is the most likely diagnosis=Systemic lupus erythematosus
- Which one of the following is associated with prognosis in SLE = Anti-dsDNA

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364. PERIARTICULAR EROSION IS A FEATURE OF=RHEUMATOID ARTHRITIS

REMEMBER

	Osteoarthritis	Rheumatoid arthritis	Osteomyelitis
Presentation	❖ Asymmetric joint involvement. ❖ Morning stiffness of <15 minutes ❖ Improving with rest.	❖ Symmetric joint involvement ❖ Morning stiffness of > 1 hour ❖ Improving with activity	❖ Osteomyelitis is an infection of the bone
Joint Findings	❖ Heberden's nodes ❖ Bouchards nodes	❖ Swan-Neck Boutonniere deformity ❖ Ulnar deviation of fingers	❖ Localized pain ❖ Tenderness ❖ +/- Fever
Radiographic Hallmarks	Mnemonic: **LOSS** ❖ **L**oss of joint space--**typically non-uniform** ❖ **O**steophytes ❖ **S**ubarticular sclerosis ❖ **S**ubchondral cysts	❖ Loss of joint space--**typically uniform** ❖ Soft tissue swelling ❖ **Erosions** ❖ Periarticular osteopenia	MRI is the imaging modality of choice
Lab Findings	❖ RA factor→ -ive ❖ ESR, CRP → Norm ❖ Anti-CCP→ ive	❖ RA factor→+ive (70%- non-specific) ❖ ESR, CRP → raised ❖ Anti-CCP→ +ive (90% -- more specific)	❖ Most common agent→ S. aureus ❖ IV drug users → S. aureus ❖ Neonates→ H. influenza ❖ Sickle cell disease→ Salmonella

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Most common manifestation of autoimmune disease=hematological changes
- Periarticular erosion is a feature of=Rheumatoid arthritis
- Most specific marker for rheumatoid arthritis is=Anti CCP
- A middle-aged woman with complaints of pain in hands joints making her unable to perform daily activity in 6 years', her hands had starting to deform and she had nodules on extensor surface. The most likely diagnosis is=RA

- A 45-year-old female with joint pain presenting with morning stiffness and pain. The pain lasts for few minutes. What is your diagnosis=Osteoarthritis
- Brodie's abscess occurs in= Pyogenic osteomyelitis
- Osteomyelitis of mandible is commonly caused by=Staphylococcus aureus

TYPE OF HYPERSENSITIVITY REACTION IN MYASTHENIA GRAVIS= TYPE 2

YASTHENIA GRAVIS VS. LAMBERT-EATON SYNDROME

	Myasthenia Gravis	Lambert-Eaton Syndrome
Frequency	Most common NMJ disorder	Uncommon
Pathophysiology	Autoantibodies to postsynaptic nicotinic ACh receptor type 2 hypersensitivity reaction	Autoantibodies to presynaptic Ca2+ channel → ↓ACh release
Clinical	Ptosis, diplopia, weakness Worsens with muscle use and recovery on rest. Improvement after edrophonium (Tensilon) test	Proximal muscle weakness, autonomic symptoms (dry mouth, impotence) Improves with muscle use
Associated With	Thymoma, Thymic hyperplasia	Small cell lung cancer
AChE Inhibitor/ anticholinesterases Administration	Pyridostigmine and Neostigmine	Minimal effect

OW LET'S PRACTICE SOME PAPER MCQ'S

- Myasthenia gravis antibodies are present against=. Nicotinic receptor
    - Remember
    - The receptors for acetylcholine and nicotinic are present in=Neuromuscular junction
- Neostigmine Preferred in Which Disease= Myasthenia Gravis
- Treatment of Myasthenia gravis= Anticholinesterase
- In Myasthenia gravis, which of the following is responsible for pathogenesis= Ig G
- Acetylcholine Antibodies is associated with= Myasthenia gravis
    - Remember
        - Lambert-Eaton myasthenic syndrome (LEMS)= autoantibodies against calcium channel
- Diagnostic test for myasthenia gravis= EMG
    - Myasthenia gravis Investigations: (Ref MTB step 2 CK)
    - Best initial test: acetylcholine receptor antibodies (80%–90% sensitive) ---For patients without those antibodies, get anti-MUSK antibodies (muscle-specific kinase).
    - Edrophonium: short-acting inhibitor of acetylcholinesterase.
    - **Most accurate test: Electromyography** shows decreased strength with repetitive stimulation.
    - CT/ MRI to exclude thymoma (CT with contrast is best than MRI)
- Which initial drug is given in myasthenia gravis to decrease ACh degradation in neurosynaptic junction= Neostigmine
- A patient of myasthenia gravis is being treated with Neostigmine and Atropine but is still symptomatic. Test dose of Edrophonium relieves symptoms. What is a reasonable approach for future management= Increase Neostigmine dose
- Inherited condition in which there is low K and leads to low muscle tone and weakness= Familial periodic paralysis
- Where is the antibody targeted in Lambert-Eaton syndrome= Voltage-gated calcium channels

CHAPTER # 12

GENERAL PATHOLOGY

366. ORGAN HAVING LEAST CHANCES OF INFARCTION = LIVER

- Any organ with multiple supplies will have least chance of infarction and there infarct would be Red (hemorrhagic) infarcts e.g. Liver, Lung, Intestine, testes
- Pale (anemic) infarcts occur in solid organs with a single (end-arterial) blood supply. Example such as Heart, Kidney, and Spleen

NOW LET'S PRACTICE SOME PAPER MCQ'S

- A pt was diagnosed to have a pale infarct. In which of following conditions does it occur= Embolic/ischemic stroke
- Which of these is least likely infarcted in arterial supply blockage= Liver
- Red infarcts are encountered due to arterial blockage in= Tissue with a double circulation
- A hemorrhagic infarct most typically is present in one of the following situation= Lung with pulmonary thromboembolism
- White infarct occurs in which of the following = Heart
- White infarct in heart occurs due to? = Occlusion in artery
- An obese lady presented with chest pain, what type of infarction is seen in heart? = White infarct

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367. TYPE OF NECROSIS IN BRAIN INFARCTION = LIQUEFACTIVE NECROSIS

REGARDING NECROSIS

- Brain = Liquefactive necrosis
- Solid organs (kidneys, heart and adrenal glands) = coagulative necrosis
- T.B = caseous necrosis
- Pancreatitis= enzymatic fat necrosis
- Breast trauma or abdominal trauma= traumatic fat necrosis
- Polyarteritis nodosa (any vascultitis) = fibrinoid necrosis.
- Sarcoidosis= Non caseating granulomas
- Gummatous necrosis= syphilis
- Medial necrosis= aortic dissection
- Dry gangrene =Coagulative
- Wet gangrene= superinfection, Liquificative superimposed on coagulative

NOW LET'S PRACTICE SOME PAPER MCQ'S

FIBRINOID NECROSIS

- Polyarteritis nodosa diagnosis by= Fibrinoid necrosis
- Wegner glomerulus vascultitis most diagnostic feature= Fibrinoid necrosis
- Microscopic diagnosis of Polyarteritis nodosa vasculitis in female is by=Fibrinoid necrosis in arterioles

COAGULATIVE NECROSIS

- Regarding gangrene= Coagulative necrosis
- Type of necrosis that occurs in cardiac cells= Coagulative
- MI patient died. On autopsy coagulative necrosis and neutrophils. Age of infarct= 24 hour

- A Pt. suffered anterior wall MI due to embolus in his coronary artery. Which type of necrosis is seen in th pt.= Coagulative necrosis
- The type of necrosis seen in MI is=Coagulative
- Female Patient died of MI. Her heart size was normal but Lipofuscin was found in cardiac fibers. Diagnosis= Autophagy
- What type of Necrosis seen in heart and kidney=Coagulative necrosis
- Outline of a cell is preserved in which of the following necrosis=Coagulative
- An embolus lodged in a branch of the renal artery. A day later there is a focal area in which the renal parenchymal cells in the distribution of the occluded artery show karyolysis and karyorrhexis. The outlines of the cells are still visible, but the nuclei have lost basophilic staining and the cytoplasm is eosinophilic but pale. Which of the following types of cellular necrosis is most likely present=Coagulat
- An old male presented in ER with severe chest pain, life supportive treatment was given. He died after 4 days. On autopsy, there was coagulative necrosis of anterolateral wall of left ventricle. Microscopy shows= Collagen fibroblast necrotic tissue
- An elderly obese man with severe atherosclerosis developed acute abdominal pain. on laparotomy sma intestine was dark purple in colour. Superior mesenteric artery was atherosclerotic and thrombosed, mesenteric vein patent. This small intestine pathology will be called= Wet gangrene

LIQUEFACTIVE NECROSIS

- A pt. with hemiplegia, CT scan shows ischemia of brain. What type necrosis occurs= Liquefactive necrosis
- Type of Necrosis in brain= Liquefactive
- Patient with diagnosis to have stroke... on CT there was pale infarct... What could be cause= Emboli ischemic stroke
- What type of necrosis is seen in ischemic brain injury=Liquefactive
- A 68-year-old woman suddenly lost consciousness; on awakening 1 hour later, she could not speak or move her right arm and leg. Two months later, a head CT scan showed a large cystic area in the left parietal lobe. Which of the following pathologic processes has most likely occurred in the brain=Liquefactive necrosis

FAT NECROSIS

- Pt. with pain in abdomen radiating to the back. Serum lipase raised. Type of necrosis present in the mesentery lying in front of that organ? (case of acute pancreatitis) = Fat necrosis
- What type of Necrosis seen in acute pancreatitis= Fat necrosis
- Necrosis seen in omentum during pancreatitis= Fat necrosis
- Most common cause of Fat Necrosis= Trauma
- What type of Necrosis seen in acute pancreatitis=Fat necrosis
- Common cause of breast fat necrosis is=Trauma

CASEOUS NECROSIS

- A pt. with right hypochondrium pain liver biopsy showed large Epitheloid cells with granulomatous disease in center one giant cell with multiple nucleoli in periphery what is it indicating= caseous necrosis
- On histological examination of liver shows centrally distorted area that is surrounded by Epitheloid cell lymphocytes and giant cells. Which of following is most likely lesion=Caseous necrosis.
- On microscopy of Lymph Node biopsy specimen, granuloma was found. What would make his diagnosis of TB= Caseous necrosis
- Patient presented with dry cough, low grade fever and malaise for few months. What will be seen on microscopy= Caseous granuloma
- Non-caseating granuloma, hilar lymphadenopathy, hypercalcemia. Diagnosis= Sarcoidosis
- Fever for 6 months hilar lymphadenopathy caseous necrosis= TB
- Patient presents with signs of low-grade fever, non-healing ulcer on tongue and cervical lymphadenopathy. Histology shows granuloma with caseous necrosis, CXR shows normal hilar lymph. Diagnosis is = Tuberculosis

- A patient with cervical lymphadenopathy. CXR shows bilateral hilar lymphadenopathy. Biopsy shows typical granuloma with granulomatous necrosis in submandibular and sublingual gland. Diagnosis is=Sarcoidosis

NOTE THIS

- Gummatous necrosis occurs in= syphilis

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368. A PATIENT PRESENTS WITH TYPE 2 DIABETES MELLITUS. MOST LIKELY COMPLICATION IN LIMB WILL BE= DRY GANGRENE

- When asked gangrene in Diabetes=Dry gangrene
- When asked Diabetes with common complication in limbs=Dry gangrene (I have only included this as many people will tell u with complication its wet gangrene-)
- Superimposed bacterial infection in ischemic tissue results in= Gangrenous necrosis
- What is the common complication of diabetes in limbs is= Dry gangrene

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369. NATURAL DEFENSE AGAINST CANCER IS = APOPTOSIS

ALSO NOTE THAT

- Councilman bodies in scenario= click Apoptosis
    - Also remember councilman bodies are also seen in viral hepatitis and yellow fever
    - If both yellow fever and apoptosis in scenario choose yellow fever
- Chemotherapy/ hormonal therapy or radiotherapy done shrinkage of cell mechanism= Apoptosis
- Step in Apoptosis = Activation of caspases

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Councilman bodies= Apoptosis (also seen in yellow fever)
- A 28-year male with history of jaundice and raised ALT. The liver histology shows councilman bodies. These are most likely to be process of=Apoptosis
- Apoptosis= Programmed cell death
- Cancer shrinkage after radiotherapy due to= Apoptosis
- How does tumor regress in hormonal therapy= Apoptosis
- A patient has carcinoma of uterus, she is on chemotherapy for the last 6 months, which of the following mechanism is responsible for decrease in size of cancer in this condition= Apoptosis
    - After chemotherapy, the tumor size regresses by= Apoptosis
- Duct of submandibular gland is blocked by stone. Change that occur secondary to it= Apoptosis
- Parotid gland swelling is found in a patient on examination. On investigation, stones in duct are found. The gland regress due to=Apoptosis
- Apoptosis is induced by activation of=Oncosuppresors
- Intrinsic and extrinsic pathway for cell death are involved in which process=Apoptosis
- The most important aspect of apoptosis is= Prevent overcrowding of cells
- What starts apoptosis= activation of caspases
    - Also remember While Bcl-2 and Bcl-x are antiapoptotic
    - Caspases are involved in= Apoptosis
- Woman with pro myelocytic leukemia presented with (Picture of Councilman Bodies was given) Eosinophilic cytoplasm etc. Mechanism involved was asked= Apoptosis
- Young married woman delivered a healthy baby boy... Now by which mechanism size of uterus will be reduced or become normal= Apoptosis
- Blood film of a patient of acute promyelocytic leukemia shows several cells which are large, have irregular out line, contains structure less eosinophilic cytoplasm and multiple basophilic homogenous round bodies. Which type of cell injury you suspect= Apoptosis
- Important natural defence mechanism against the development of neoplasia is= Apoptosis

- The process of apoptosis is lost during carcinogenesis. Which factor has anti-apoptotic activity= BCL

KNOW THE DIFFERENCE

- Which of the following is a feature of necrosis= Smear pattern of DNA fragmentation
- Which of the following is characteristic of apoptosis= Ladder pattern fragmentation of DNA

370. IN INTRAVASCULAR DAMAGE, WHAT IS ACTIVATED FIRST BY COMING INTO CONTACT WITH COLLAGEN= FACTOR 12

INTRINSIC VS. EXTRINSIC PATHWAY

Intrinsic Pathway	Extrinsic Pathway
❖ Intrinsic pathway is activated by subendothelial collagen.	❖ Extrinsic pathway is activated by tissue thromboplastin
❖ aPTT is used to check it, which is a measure of factors II, V, VIII, IX, X, XI, XII, and fibrinogen	❖ Prothrombin time (PT) is used to check it, which is a measure of factors II, V, VII, X, and fibrinogen.
❖ All clotting factors are proteins and synthesized in liver except Factor IV & VIII	

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Which factor activated clotting as well as kinin system= Hageman factor (Factor 12)
- Laceration on a girl's finger, which when in contact with exposed basement membrane kinin and platelets aggregation is activated. Which of the following factor is responsible= Hageman factor
- In Intravascular damage, what is activated first by coming into contact with collagen= Factor 12
    - It also comes as
        - Endothelial cells initiate intravascular coagulation by activating=Factor 12
        - In Endothelial injury which intrinsic factor will be activated= Factor 12
- Factor 8 is produced by=Endothelial cells
- One scenario was all bleeding profile normal except PT prolonged which factor deficient= factor 7
- Cryoprecipitate contains which of the following factor= Factor 8
- When factor 8 is not available, the next best source is=Cryoprecipitate
- Most important step in coagulation pathway= Fibrinogen to fibrin
- Which of the following factors decrease during pregnancy= Anti-thrombin 3
- A pt put on warfarin, which is the first factor to be decreased=Factor 7
- Fibrin is stabilized by=Factor 13
- Which is the best source given for Factor 9 in its deficiency= FFP
- Extrinsic and intrinsic pathway of coagulation of merge at=Stuart factor
- Factor involved in endothelial injury repair= Platelet
- The investigations of bleeding disorder in a 2-year-old boy reveal a deficiency of factor VIII. His sisters are unlikely to have this disease because the mode of transmission in this case is most likely to be? = X-linked recessive
- Coagulation factor that initiates in vivo coagulation? = Factor VII
    - It also comes as
        - The coagulation factor that initiates in vivo coagulation and plays a central role in the activation of other coagulation proteins is=Factor VII.
        - The clotting factor which is not required for the process of blood coagulation via the intrinsic pathway is: = Factor VII

371. VIT K DEPENDENT FACTORS ARE=FACTOR 2, 7, 9, 10

LEARN IT BY MNEMONIC: CS 1972

- Protein C and S and Factors 10, 9, 7, and 2 are Vitamin K dependent fac

- Vit K dependent factor= Prothrombin (as it is also called factor II)
- Vit-k deficiency→**normal bleeding time** , ↑PT, ↑APTT
  - While In platelet disorders like ITP, TTP→↑BT, ↓PC
  - Also remember in VIT-K deficiency first and foremost factor depleted will be **Protein C>Protein S>factor 7.**
- Vitamin K is synthesized by the normal flora in the intestine, and green vegetables are the most common dietary source

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- A neonate delivered at home was brought by the mother to a pediatrician with complaints of easy bruising, bleeding, jaundice, and rash. The mother gives a history of taking antibiotics in pregnancy. The deficiency of which of the following has led to the condition of the child? = Vitamin K
  - It also comes as
    - Patient after penetrating abdominal injury on antibiotics for 12-week therapy and 3-week TPN with ecchymosis Platelet normal while PT 14 secs cause = Vitamin K deficiency
    - A patient develops prolongation of PT and APTT with a normal platelet count after administration of antibiotics. What should be given in treatment? = Vitamin K
    - Prolongation of prothrombin time following antibiotic treatment is treated with? = Vitamin K
- A 42-year-old man with a history of chronic alcohol abuse has noted during the past year that he has bruising with minimal trauma. Which of the following nutrients is most likely to be of benefit in treating this man? = Vitamin K
- A 14-year-old boy reports with the complaints of profuse and prolonged bleeding from minor trauma for the last few months. He is also having chronic diarrhea. There is no such family history. On investigation; bleeding time = 6 min and clotting time = 50 min. The most likely diagnosis is: = Vitamin K deficiency
- The deficiency of which vitamin will lead to decreased levels of prothrombin? = Vitamin K
  - It also comes as
    - In a woman, deficiency of vitamin K leads to bleeding tendency which is due to the deficient synthesis of: = Prothrombin
    - In a patient with obstructive jaundice, there is increased clotting time due to= Prothrombin deficiency
    - Patient with obstructive jaundice (scenario leading towards vit K def.). What will be deficient=Prothrombin
- The most common source of vitamin K is = Green vegetables
- One of the following vitamins is involved in clotting factor synthesis: = Vitamin K
  - It is also asked as
    - Which vitamin is involved in the synthesis of prothrombin = Vitamin K
- Normal flora of the intestine synthesize? = Vitamin K
- A bleeding tendency and deficiency of clotting factors II, VII, IX, and X is due to? = Vitamin K deficiency
- Cause of bleeding in a newborn with a diabetic mother = Vitamin K deficiency
- A neonate delivered at home with easy bruising, bleeding, jaundice, and rash. The deficiency is = Vitamin K
- PT test is done in=Jaundice

372. HEPARIN PRIMARILY WORKS THROUGH= ANTI-THROMBIN 3

HEPARIN VS WARFARIN

- Heparin acts on intrinsic pathway	- Warfarin acts on extrinsic pathway (inhibit the enzyme Vit-k reductase)
Mnemonic: **PTT**rainer made us did **HP** exercises while counting from **8** -**1** to -**12** .	Mnemonic: **WEPT 1972** - **W**arfarin acts on **E**xtrinsic pathway,**PT** is used to check it, factors are **1 0**,**9** **7**, **2**

- aPTT is used to check Intrinsic Pathway, factors are 8,9,10,11,12 and 2

NOW LET'S DISCUSS SOME PAPER MCQ'S

- True about Warfarin= Factors affecting is 2
- Test to monitor oral anticoagulant=INR
- How to monitor a patient on warfarin (or on Oral anticoagulant therapy) = INR>PT
    - Also remember to monitor a patient on Heparin= aPTT
- Pregnant women 1st trimester develops Atrial fibrillation what would u give= IV Heparin
    - Heparin can be given as it does not cross placenta, while warfarin shouldn't be given as it crosses placenta (teratogenic)
- Warfarin toxicity treated by = FFP
    - Remember that for warfarin toxicity both are used Vitamin K gives delayed effect, while fresh frozen plasma gives immediate effect.
- Heparin primarily works through= Anti-thrombin 3
    - Other questions related to heparin are
        - Heparin acts by binding to= Factor Xa and thrombin
        - Low dose heparin acts by=Inhibits activated factor 10
        - Heparin, histamine and protease release from= Mast cells
        - Heparin inhibits/prevents= propagation of clot
        - Heparin acts on which pathway= intrinsic pathway
        - Similarity between LMWH and heparin= both act same on Xa
        - Heparin needs which anticoagulant factor to be present for its action= antithrombin III

373. NATURAL ANTICOAGULANT/ANTITHROMBOTIC = HEPARIN

- While naturally occurring fibrinolytic/thrombolytic= Plasminogen

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Which antithrombotic is present naturally in blood = Heparin
- Which one of the following is naturally occurring thrombolytic= Plasminogen
- In order for heparin to be an effective anticoagulant, naturally occurring inhibitor of clotting is required. The most likely inhibitor is= Antithrombin 3
- Anticoagulant are contraindicated in= Thrombocytopenia
- Pregnancy reduce=Factors antithrombin III

374. IN PULMONARY TB, PATIENT HAS CAVITATION WITH CALCIFICATION. THIS TYPE OF CHANGE IS CALLED=DYSTROPHIC CALCIFICATION

NOTE

Metastatic Calcification	Dystrophic Calcification
Occurs in previously healthy tissues	Occurs in previously/already damaged tissues
The cause of metastatic calcification is hypercalcemia	The cause is not hypercalcemia; typically, the serum calcium concentration is normal.
Hypercalcemia most often results from any of the following causes: o Hyperparathyroidism	Areas of old trauma Tuberculosis lesions Scarred heart valves, and Atherosclerotic lesions

- Osteolytic tumors with resultant mobilization of calcium and phosphorus
- Hypervitaminosis D
- Excess calcium intake, such as in the milk–alkali syndrome (nephrocalcinosis and Renal stones caused by milk and antacid self-therapy)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Case of pulmonary TB with cavitation shows calcification. Reason= dystrophic calcification
- A baby with papilloma of choroid plexus. On CT, calcification will be present in= Trigone of lateral ventricle
- The most common cause of metastatic calcification in kidney is= Hyperparathyroidism
- Dystrophic calcification commonly occurs in=Necrotic tissue
- The mechanism involved in the formation of psammoma bodies in papillary carcinoma
- of thyroid is= Dystrophic calcification

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375. BAR BODIES DIAGNOSTIC FOR = TURNER

REMEMBER

- Diagnostic for = Turner
- While when asked best diagnosis for turner= Karyotyping
- Bar bodies absent in = Turner
- Scanty Barr body = Turner
- Barr bodies= Total X chromosome minus one (e.g. In xxx there are 2 bar bodies)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- One Bar body present in nuclei/cell of= Normal female
- Webbed neck and absent bar body is diagnostic for= Turner syndrome
- Absent bar bodies present in=Turner syndrome
- Bar bodies most commonly related with which blood cell=Neutrophil
- The most likely condition which may show scanty Barr body is= Turner's syndrome
- Barr bodies test from cells of buccal smear is done mainly for the diagnosis of: = Turner's syndrome
- A female has a karyotype configuration of XXX. The number of sex chromatin (Barr body) in her cells will be: = 2

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376. KARYOTYPE OF A TRUE HERMAPHRODITE IS = 46XX/46XY

377. PSEUDO HERMAPHRODITE . WITH 46XY = ADRENOGENITAL SYNDROME

ALSO REMEMBER.

- Klinefelter Syndrome= 47, XXY
- Turner Syndrome= 45, XO
- Male Pseudohermaphrodite= 46XY
- The pattern of sex chromosome in a true hermaphrodite is = XY
- Female Pseudohermaphrodite= 46XX
- Complete Mole = 46XX; 46XY
- Partial Mole Karyotype = 69XXX; 69XXY; 69XYY
- Congenital adrenal hyperplasia=46XX and ambiguous genitalia

- ❖ The composition of urine in Adrenogenital syndrome will be= Increase 17 - α - ketosteroid, decrease cortisol, decrease pregnanolone

378. A SCENARIO OF GYNECOMASTIA TALL HEIGHT CHROMOSOMAL STUDY SHOWS XXY= KLINEFELTER SYNDROME

REMEMBER THESE HIGHLY REPEATED SYNDROMES

Klinefelter Syndrome	❖ Karyotype 47, XXY ❖ Manifested by male ❖ Gynecomastia ❖ Tall stature, Male hypogonadism ❖ Atrophic testes
Turner Syndrome	❖ Karyotype XO (45, X) is characteristic. ❖ Manifested by females ❖ Female hypogonadism ❖ Replacement of the ovaries by fibrous streaks ❖ Infantile genitalia and poor breast development ❖ Short stature, webbed neck, ❖ Coarctation of the aorta (femoral < brachial pulse). ❖ Turner syndrome is also often associated with autoantibody-mediated hypothyroidism. ❖ Horseshoe kidney. ❖ Most common cause of 1° amenorrhea. ❖ No Barr body
Marfan syndrome	❖ Connective tissue disorder due to deficiency of fibrillin. ❖ Characteristics include defects in ○ Skeletal→ tall and thin, hyperextensible joints, spider-like fingers (arachnodactyly) ○ Visual→ Dislocation of the ocular lens (ectopia lentis) ○ Cardiovascular → aortic dissection

NOW LET'S PRACTICE SOME PAPER MCQ'S

MARFAN SYNDROME

- ❖ What is related to Marfan syndrome in a 30-year-old man = Inherited deficiency of fibrillin
    - ○ It also comes as
        - Which of the following is defective in Marfan syndrome = Fibrillin
        - Which inherited protein defect is responsible for Marfan syndrome = Fibrillin
        - A young man diagnosed as Marfan syndrome will have defect in = Inherited defect in fibrillin
- ❖ Lens dislocation with hypermobile joints. Diagnosis = Marfan's syndrome
- ❖ A tall young man presented with sudden excruciating chest pain and dyspnea. O/E BP 90/50 with subluxation of lens. Condition associated with it is = Dissecting aortic aneurysm
    - ○ It also comes as:
        - A tall man performing in a circus develops sudden excruciating tearing chest pain and lens dislocation. O/E BP 90/40 and heart rate 130. The cause of chest pain is = Dissecting aortic aneurysm
- ❖ Patient with mid-systolic murmur. Echo shows leaflet of mitral valve displaced upward and aortic insufficiency. Lens dislocation, Defect in = Fibrillin

KLINEFELTER SYNDROME

- ❖ Karyotype of Klinefelter syndrome = 47 XXY
- ❖ Klinefelter syndrome is caused by = Extra X chromosome

- The main feature of Klinefelter syndrome is = Gynecomastia
- About Klinefelter syndrome, the most appropriate statement is = Gynecomastia is always present
- Klinefelter syndrome = Leydig cells hyperplasia
- A male presented to OPD with complaints of gynecomastia with no drug history. Further workup revealed azoospermia, underdeveloped testes, and a genetic configuration of XXY. What is the likely diagnosis = Klinefelter syndrome
- A young boy with small testicles and gynecomastia was diagnosed as Klinefelter's syndrome. His most likely karyotype will be = 47 XXY
- In a 25-year-old pregnant woman, amniocentesis revealed fetal karyotype of 47 XXY. The fetus is most likely to suffer from the syndrome of = Klinefelter's
- Male with small testes, gynecomastia, and XXY genotype. Diagnosis = Klinefelter
- Elongated body and gynecomastia were present in the scenario. Diagnosis was asked = Klinefelter
- A scenario of a male with XXY = Klinefelter syndrome

TURNER SYNDROME

- A woman with edema of the dorsum of the hand and nape of the neck likely has = Turner syndrome
- A woman presents with edema of dorsum of hand and nape of neck. Diagnosis = Turner
- Turner syndrome involves = Hemizygous X chromosome
- A pt with karyotype XO, the most likely features will be= Gonad dysgenesis and streak ovaries
  - It also comes with different options
    - Turner syndrome characteristic feature = Streak ovary
- Characteristic feature of Turner syndrome = Streak Ovaries
  - It also comes with different options
    - Characteristic feature of Turner syndrome = Short stature
- Turner syndrome with = Stunted growth is the main feature
- Short stature, webbed neck = XO
- Cystic hygroma associated with = Turner
- A female with primary amenorrhea, webbed neck, and a height of 141 cm. What would her karyotype show = 45 XO
  - It also comes with different options
    - A female patient with webbed neck, height 124 cm. Her karyotype most likely is = 45 XO
    - A female with primary amenorrhea, absent secondary sexual characteristics. What would her karyotype show = 45 XO
    - A young female of short stature presented with amenorrhea and webbed neck. Diagnosis = 45 XO

ALSO NOTE THESE

- In 17 hydroxylase deficiency, which step is affected=Pregnenolone to 17-OH Pregnenolone
- A 6-year girl presented to OPD with excessive facial and chest hair, adult size external genitalis and deepening of voice. She gives history of 2 sibling death suffering with similar condition. Which test would best confirm the diagnosis=21 hydroxylase

379. A FEMALE BABY WITH SEX CHROMATIN POSITIVE AND ENLARGED CLITORIS. DIAGNOSIS=ANDROGENITAL SYNDROME

NOTE

Complete Mole	Karyotype: 46 XX; 46 XY Fetal parts: No "Honeycombed" uterus or "clusters of grapes", "snowstorm" appearance on ultrasound
Partial Mole	Karyotype: 69 XXX; 69 XXY; 69 XYY Fetal parts: Yes

<table>
<tr><td>True hermaphrodite</td><td>This rare condition is characterized by both ovarian and testicular tissue, with ambiguous external genitalia and both X and Y chromosomes</td></tr>
<tr><td>Pseudohermaphrodite</td><td>This organism has gonads of only one sex, but the appearance of the external genitalia does not correspond to the gonads present.
<table>
<tr><th>Male Pseudohermaphrodite</th><th>Female Pseudohermaphrodite</th></tr>
<tr><td>❖ Genotype: 46XY</td><td>❖ Genotype: 46XX</td></tr>
<tr><td>❖ The gonads are testes, but the external genitalia are not clearly male.</td><td>❖ The gonads are ovaries, but the external genitalia are not clearly female.</td></tr>
<tr><td>❖ Causes:
○ Tissue resistance to androgens (testicular feminization) is the most common cause</td><td>❖ Causes:
○ The condition is most often caused by increased androgenic hormones from congenital adrenal hyperplasia</td></tr>
</table>
</td></tr>
</table>

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Snowstorm appearance occurs in = Complete mole
- A pregnant female with a large-for-date uterus. USG shows Snow Storm appearance with no fetus. The likely diagnosis is? = Complete Mole
- Complete mole is characterized by = Diploidy.
- The next step in managing a patient with complete hydatidiform mole is to check for = Increased serum β-HCG
- Patient with 46XX and ambiguous genitalia= Congenital adrenal hyperplasia
- A lady with 26-week gestation has uterine height of 24 weeks. On sonography there is no fetal parts and shows snowstorm appearance. Likely diagnosis is=Karyotype 46XX
- A normal looking girl with height 5 feet on ultrasound she was having short blind vagina with normal vulva scanty pubic and axillary hairs normal breast absent uterus her karyotype is=46XY
- A girl 18 yrs old with hx of amenorrhea otherwise normal appearance and secondary sexual characteristics. On USG absent ovaries and uterus. What is the cause=Testicular feminization syndrome

380. LONG SCENARIO, CHILD WITH HYPOCALCEMIA (OR TETANY), HAVING SOME CARDIAC PROBLEMS AND LOTS OF VIRAL INFECTIONS MENTIONED =22Q11 (DIGEORGE SYNDROME)

ALSO NOTE

Cri du chat (5p-, cry of the cat) syndrome	Mnemonic: **SMALL HEAD CAT is CRYING because she lost 5$ in her HEART SHAPED PURSE** ❖ Microcephaly, mental retardation, Cat like cry, deletion of short arm of chromosome 5, congenital heart diseases.
DiGeorge/velocardiofacial syndrome (microdeletion of 22q11, CATCH 22 syndrome)	Mnemonic: **CATCH 22** ❖ **C**ardiac abnormalities, **A**bnormal facies, **T**-cell deficit because of **T**hymic hypoplasia, **C**left palate, **H**ypocalcemia because of hypoparathyroidism, and microdeletion **22**q11
Edwards syndrome (trisomy 18)	Mnemonic: **PRINCE E**dward ❖ **P**rominent occiput, **R**ocker-bottom feet, **I**ntellectual disability, **N**ondisjunction (most common cause), **C**lenched fists (with overlapping fingers), low-set **E**ars
Patau syndrome (trisomy 13)	Mnemonic: (Trisomy 1**3**= **3**M, **3**P) ❖ **M**ental retardation, **M**icrocephaly, **M**icrophthalmia ❖ Cleft li**P** and **P**alate, **P**olydactyly

Down syndrome

- ❖ Most common chromosomal disorder and most common cause of mental retardation
- ❖ Trisomy 21 in 95% cases, while translocation in 5% cases
- ❖ Features:
    - o Mental retardation, Large forehead, broad nasal bridge, wide-spaced eyes, epicanthal folds, large protruding tongue, and small low-set ears, simian crease, a single palmar crease,

Diagnosis

- ❖ Triple screen
    - o B-HCG is increased.
    - o Alpha feto protein is decreased
    - o Estriol is decreased.
- ❖ Quadruple screen
    - o And if we add up inhibin which is increased then it will be called as quadruple test or tetra screen

- Note: Down syndrome (trisomy 21) → Drinking age is 21
- Edwards syndrome (trisomy 18) → Election age is 18
- Patau syndrome (trisomy 13) → Puberty age is 13

NOW LET'S PRACTICE SOME PAPER MCQ's

- ❖ In a female married after 40 years of age there is increased risk of=Down syndrome
- ❖ The incidence of down syndrome in a 40 years' female is=1:100
- ❖ Hypertelorism, Oblique palpebral fissure. Diagnosis= Trisomy 21
- ❖ Scenario of depressed nasal bridge, simian crease. Diagnosis= Trisomy 21
- ❖ Regarding Down syndrome=Trisomy 21
- ❖ A kid presented with short stature, protruded tongue, muscles and joints hyper-flexibility, and upward slanting of epicanthal fold. Which chromosomal abnormality best describes this condition=Trisomy 21
    - o It also comes as
        - ▪ A child with mental retardation, hypotonia, hypermobility, protruded tongue, umbilical hernia and upward slanting of the lateral epicanthus. The most likely trisomy is of= Chromosome 21
- ❖ During meiosis, abnormalities may occur if one of the cells gets an extra chromosome instead of haploid number. This condition is called=Trisomy
- ❖ A baby with large tongue, hypotonia, umbilical hernia mental retardation and elevated lateral epicanthal folds. Trisomy most likely associated with these findings is=21
- ❖ Patient came for Antenatal checkup. Sample taken from amniocentesis shows low alpha fetoprotein. Likely diagnosis is=Down Syndrome
- ❖ A child presents with mental retardation and low set ears, bilateral ptosis, epicanthal folds, and alternate esotropia. What is the diagnosis= Down syndrome
- ❖ Single palmar crease is seen in which syndrome= Trisomy 21
- ❖ A baby with small Retinal dysplasia and optic nerve problems= Trisomy 13
- ❖ Trisomy 21 occurs in= Down syndrome
- ❖ A 37 years old pregnant female having 3 poor obstetrical history and Decrease alpha fetoprotein in amniotic fluid. Diagnosis= Down syndrome
- ❖ Pt. came for antenatal check-up gave h/o congenital anomaly in family. DR told her that her baby has congenital anomaly. Labs shows decreased level of AFP. And other labs were advised. Diagnosis= Down syndrome
- ❖ Following is most commonly associated with mental retardation= Down syndrome
- ❖ Gravida 4 has already a Down syndrome child. She is now 12weeks pregnant and anxious about future outcome of this pregnancy regarding Down syndrome. What investigation is suitable at this stage= Multiple tests (βHCG +PAPP-A +Nuchal translucency)

- ❖ A female Pt. with family hx of fetal abnormalities has been found with decreased Maternal AFP, Dx= Down syndrome
- ❖ Long scenario of Down syndrome, and u took villous sample, what do u want to see= Cytogenetic abnormality
- ❖ Most common chromosomal abnormality = Down syndrome
- ❖ During meiosis abnormalities may occur if one of the cell gets an extra chromosome instead of haploid number. The condition is called= Trisomy
- ❖ Down syndrome associated with= Alzheimer disease
- ❖ A new born baby with tetany Ca++ level given, on examination there is murmur baby is suffering from infection by pneumocystis carini Aspergillus herpes simplex. diagnosis= DiGeorge 22q deletion
- ❖ Mother gives history of alcohol consumption during 1st trimester; her baby was at risk of developing= Microcephaly
    - o It is also asked as (remember to prefer microcephaly over premature birth)
        - ▪ Mother had alcohol during pregnancy, baby is at risk of developing= Microcephaly

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381. REGARDING HYPERTROPHY= INCREASE IN SIZE OF CELL

REMEMBER

Feature	Explanation
Hypertrophy	❖ Increase in size of cell resulting in → ↑ in size of organ
Hyperplasia	❖ Increase in number of cells resulting in → ↑ in size of organ Example: o Glandular proliferation of breast during pregnancy ❖ Hyperplasia and hypertrophy can occur together. Example: o Enlargement of uterus during pregnancy
Atrophy	❖ Shrinkage in size of cell as a result of loss of cell substance ❖ Example: o Loss of innervation, diminished blood supply, inadequate nutrition, aging
Metaplasia	❖ Reversible change in which one cell type is replaced by another cell type. ❖ Example: o Squamous metaplasia: ✓ In cigarette smokers, change of normal ciliated columnar epithelium of trachea and bronchi by stratified squamous epithelial cells ✓ Replacement of columnar epithelium at the Squamocolumnar junction of the cervix by squamous epithelium

NOW LET'S PRACTICE SOME PAPER MCQ'S

HYPERTROPHY

- ❖ What adaptive change will occur in the heart in long standing hypertension=Hypertrophy
- ❖ A 26 yr. old hypertensive, weight 55 kg, using no drug presented with BP 180/110 and heart weighing 450 grams. Autopsy of the heart will show=Hypertrophy
- ❖ A 60-year man with long standing HTN and aortic stenosis. The histology of his heart will show=Hypertrophy of ventricular cells
- ❖ Postmortem pt of chronic aortic stenosis will show=Hypertrophy
- ❖ Most common complication of HTN is = left ventricular hypertrophy
- ❖ An old man died because of heart disease, he is hypertensive and on autopsy his heart size is 450. Cause of increase in size of heart is= Hypertrophy
- ❖ During hypertrophy what happens= Increase DNA content
- ❖ A 20-year-old girl had Goodpasture syndrome which progressed to chronic renal failure. She was 165 cm tall and weighed 55 kg. She had BP measurements in the range of 150/90 to 180/110 mm Hg but did not

regularly take medications. Laboratory studies showed her BUN was over 100 mg/dL and required chronic dialysis. She died from heart failure. At autopsy, her heart weighed 540 gm. The size of her heart is most likely to be the result of which of the following processes involving the myocardial fibers? = Hypertrophy

- A 20-year-old woman had Goodpasture's syndrome which progressed to chronic renal failure. The size of her heart is most likely to be the result of which of the following processes involving the myocardial fibers? = Hypertrophy
- The life style pattern of healthy persons from 20 to 30 years of age are studied. A subset of these persons has a lifestyle characterized by consumption of a lot of pizza and very little physical activity. Which of the following tissue changes is most likely to develop in these subsets of persons as a consequence of this lifestyle= Hypertrophy of Steatocytes
    - Qs is taken from USMLE forum where Key is this

HYPERPLASIA

- Regeneration of liver is an example of=Hyperplasia
    - Example of compensatory hyperplasia--- although hypertrophy also plays a minor role
- Following few weeks after the patient had removal of a part of liver, scan shows that the liver defect has been replaced by new shadow. On further workup it was confirmed that the liver has regenerated itself. By what process does it happen=Hyperplasia
- A patient diagnosed with early AIDS. What will be seen on early lymph node biopsy=Follicular hyperplasia
- A 45y lady comes with vaginal bleeding, her gynaecologist advised for hysterectomy due to premalignant condition. What is the most likely diagnosis=Atypical endometrial hyperplasia
- Which of the following suggests malignancy and warrants investigation= Complex hyperplasia with atypia
- A woman has menorrhagia. Her therapeutic DNC was done. After examining the specimen doctor recommended immediate hysterectomy. What did the specimen show= complex hyperplasia

ATROPHY

- Women who has Leiomyoma and epithelium covering endometrium shows abundant stroma with a smaller number of endometrial glands. What's happening in Endometrium= Atrophy
    - (Ref: Diagnosis of Neoplasia in Endometrial Biopsies pg. 12 "Simple definition is glands to stroma ratio of > 2:1 is hyperplasia, opposite is atrophy)
- Patient had complicated delivery with history of blood loss and hypotension for 6 hours. Now blood analysis shows low ACTH. Diagnosis= Adrenal atrophy
- Which of the following is common cause of Salivary Gland Atrophy=Obstruction of Excretory ducts
- Rt 12th nerve damage causes= Rt half paralysis with atrophy of Rt side
- A child had a fracture for which cast is applied to his leg. After some time cast is removed and his calf muscles show reduced muscle mass. This is= Disuse atrophy.
- It also comes as
    - A boy had a fracture of humerus for which in ER he was advised cast for a few days. After removal of cast, the limb muscles were atrophied. This is due to= Decrease actin and myosin protein synthesis

METAPLASIA

- Regarding metaplasia=One epithelial change into another normal epithelium
- Regarding metaplasia what is correct=Change in type of tissue
- Which one of the following is reversible= Metaplasia
- Which of the following shows metaplasia=Vit A deficiency
- Metaplasia 3cm above squamous columnar junction. Diagnosis= Barret esophagus
- Gastric pain for 3 years. 3 cm above gastroesophageal junction columnar cells are seen. Diagnosis= Metaplasia
- Cervix with squamous epithelium in Endocervix it is= Metaplasia
- Polyp in Endocervix with stratified squamous epithelium. What is this condition= Metaplasia

- Change of stratified squamous epithelium at the endocervix is by=Metaplasia
- The presence of stratified squamous epithelium in endocervix is termed as=Metaplasia
- A Women with vaginal bleeding. O/E cervical polyp in endocervix lined by stratified squamous epithelium. It is due to=Metaplasia
- Person had swelling on upper arm due to some injury swelling remained 3 months but resolve in 1 year what was cause of cause of swelling= Metaplasia
    - Note: Condition called myositis ossificans (3 months' time taken by the body to reabsorb the calcification)
- After accident, a mass develops on shoulder region which regress after 3 months. Diagnosis= Metaplasia
- A young boy had fracture osseous tissue. After some months he presents with a mass containing hemorrhage. This is most likely=Metaplasia
- Chronic smoker. On bronchoscopy specimen taken from bronchus findings will be= Squamous metaplasia
- Microscopic exam of the Endocervical biopsy of a 30 yr female revealed Endocervical tissue partially lined by stratified squamous epithelium. This is due to=Metaplasia
- Person had swelling on upper arm due to some injury swelling remained 3 months but resolve in 1 year what was cause of cause of swelling=Metaplasia

OTHERS

- Breast mass showing features of firm fibrous mass. Gross appearance of Fibroadenom= Desmoplasia
- The presence of normal pancreatic tissue in gastric mucosa is termed as=Choriostoma
- In uterine fibromyoma during pregnancy=Red degeneration
- Regarding Aplasia=Failure of cell production
- Pregnant Lady (Amenorrhea of twenty weeks) presented with increased fundal height. Change in uterus is=Hypertrophy Plus Hyperplasia
- Example of hyperplasia and hypertrophy= Uterus during pregnancy
- Histologically, diagnostic features in a pt with known COPD (chronic bronchitis) is=Hypertrophy and hyperplasia of mucus secreting glands

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382. WHICH ONE OF THE FOLLOWING IS THE PRIMARY OPSONIN IN THE COMPLEMENT SYSTEM = C3B

REMEMBER

Vasoconstriction	TxA_2 (stimulates platelet aggregation) LTC_4, LTD_4, LTE_4 PAF
Vasodilation	PGI_2 (Inhibitor of platelet aggregation) PGD_2, PGE_2, $PGF_{2\alpha}$ Bradykinin PAF Nitric oxide
Anaphylaxis	C3a, C4a, C5a
Neutrophils chemotaxis	C5a, LTB_4, IL-8
Opsonins	C3b and IgG (C3b binds bacteria)
Cytolysis	C5b-9 causes cytolysis by membrane attack complex
Mediators of pain in acute inflammation	Bradykinin and PGs
Leukocyte adhesion	LFA-1
Cellular adhesion/endothelial adhesion	ICAM and VCAM (ref: First aid, page 209, edition 2017)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- WBC adhere to the endothelium via= ICAM 1
  - Don't get confused with the earlier option of selectin ----here is the explanation
    - Circulating leucocytes initially tether via selectins to endothelium, then firmly adhere to endothelium via β1 and β2 integrins—upregulates Leucocytes integrins LFA-1 and MAC-1—and both of them can bind to endothelial ICAM-1
    - There was no option of LFA-1---if present prefer that
- How does transmigration or diapedesis of white blood cells (WBCs) through the endothelium occur? = PECAM (Platelet Endothelial Cell Adhesion Molecule)
- Neutrophils are studied in blood and are found in periphery with oxygen consumption. This process is necessary for= Microbial killing
- Leukocyte adhesion molecule= LFA-1
- Which is most related to thrombin formation 1st step is= platelet adhesion
- Prostaglandins D2, E2, I2 most imp functions are= Vasodilation
- A pathologist observation a slide of neutrophils by giving Oxygen burst. What characteristics will the neutrophils show= Microbicidal action of neutrophils
- Important cytokine expressed on leukocytes after margination= LFA 1
- The term Diapedesis is related to= Leukocyte migration
- Most important factor for Phagocytosis= C3b
- In phagocytosis, which of the following are involved= C3b
- Chemotaxis is caused by one of the following most potent chemotactic agents= C5a
- C3b part of complement cascade, is responsible for= Opsonization
- The phagocytosis of bacteria is facilitated by one of the following= Component of complement C3b
- Chemotaxis is= Cellular migration
- A pregnant lady came with premature rupture of membrane; she is suspected to have Chorioamnionitis. To confirm intra-amniotic infection, which test should be done=IL-6
- A patient presented with sore throat and fever. O/E tonsils were inflamed. The most likely mediators in this process are=TNF and interleukin 1
  - Some other related MCQS. Remember the sequence →TNF + IL-1 >TNF> IL-1
    - Fever in inflammation is caused by=IL-1
    - A neutropenic hypotensive patient was admitted in oncology ward with history of high-grade fever and dysuria. Blood culture yielded growth of pseudomonas aeruginosa. The disease has occurred due to result of excessive release of=TNF
- Delayed Cell mediated immunity require=IL-12
- In injured tissue the chemotactic factor is= Interleukins 8 (no option of C5a)
- A patient suffers from appendicitis. Peripheral blood shows leukocytosis. Pain will be mediated by=Bradykinin and prostaglandin E
- Which of the following is the most potent pain mediator=Bradykinin
- Which one mediate WBC attachment to bacteria= Opsonin
- A 14-year-old boy gets his finger cut by a knife. Which one of the following is primary/early mediator of acute inflammatory response in this=Histamine
- After 12 hours along with neutrophils what will be present= Membrane attack complex
- Vasoactive amines destroyed at lungs= Serotonin
- Prostaglandin E2 and thromboxane are derivative of= Arachidonic acid
- Most common inflammatory mediator= Histamine
- Thromboxane A2 is secreted by=Platelets
- The most common important function of endothelium is the formation of=Prostaglandin I2
- The most common important function of endothelium in prevention of coagulation normally is the formation of=Prosta cyclin (PGI2)
- Clot retraction occurs due to= Thrombosthenin > Platelets
- Best index of platelet function is= Clot retraction

KNOW THE DIFFERENCE

- ❖ Which one of the following is responsible for chemotaxis= C5a
- ❖ Most Potent chemotactic agent= LTB4>> C5a
- ❖ Most potent lipoxygenase pathway= LTB4
- ❖ Which of the following is a potent chemotactic factor from Arachidonic acid lipoxygenase pathway=LTB4
- ❖ Which of the following substances is produced by the action of lipoxygenase on arachidonic acid, is a potent chemotactic factor for neutrophils, and causes aggregation and adhesion of leukocytes=Leukotriene B4

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383 A PERSON WITH SUFFERING FROM PARASITIC INFECTION. WHICH CELL TYPE WILL BE RAISED= EOSINOPHILS

REMEMBER THE CHARACTERISTICS OF CELL TYPES AS

Characteristics of Cell Types

Neutrophils

- ❖ Multi-Lobed Nucleus
- ❖ Most prominent cells in acute inflammation if first 24 hours, and disappears within 24-48 hours
- ❖ Causes include Bacterial infections and Any acute inflammation e.g. infarction

Monocyte

- ❖ Differentiates into macrophage in tissues.
- ❖ After 1-2 days, neutrophils are replaced by monocyte-macrophages
- ❖ Also involved in chronic inflammation
- ❖ Causes of monocytosis include any chronic infection (TB, malignancy)

Lymphocyte

- ❖ Refers to B cells, T cells, and NK cells.
- ❖ Prominent inflammatory cells in many viral infections

Eosinophil

- ❖ Defense against helminthic (parasites) infections and increases in response to allergies

Causes of eosinophilia = NAACP:

- ❖ Neoplasia, Asthma, Allergic processes, Chronic adrenal insufficiency, Parasites (invasive)

Basophil

- ❖ Basophil Mediates allergic reaction.
- ❖ Densely basophilic granules contain heparin (anticoagulant) and histamine (vasodilator).

Mast cells:

- ❖ Mediates allergic reaction
- ❖ Originate from the same precursor as basophils
- ❖ Release of histamine, heparin, and eosinophil chemotactic factors.

NOW LET'S PRACTICE SOME PAPER MCQ'S

NEUTROPHILS

- ❖ Pus contains=Dead Neutrophils
- ❖ In pyogenic abscess, enzymes are released by=Neutrophils
- ❖ Suppuration in abscess is caused by=Neutrophils
- ❖ Which of the following will be seen in the microscopy of acute appendicitis=Neutrophils in muscular wall
- ❖ in acute appendicitis which cells will be involved=Neutrophils
- ❖ After acute MI, free radicals produced in reperfusion injury by= Neutrophils
- ❖ Free radicals produced in reperfusion injury after MI by= Neutrophils
- ❖ Most common cells during early 48 hours of acute inflammation=Neutrophils
  - ✓ After 48 hours neutrophils are replaced by macrophages
  - ✓ Ref: BRS pathology 5th edition page 138 & page 18
- ❖ Pt died of MI, on autopsy neutrophils with necrotic area seen after=24 hours

✓ This is one of the controversial MCQ
  - Few ppl are with 48 hours and have given their reference as well
  - But this is what made us change the key to 24 hours
  - Ref: BRS pathology 5th edition page 138
  - Ref: First aid 2019 edition page 302

❖ S. aureus placed in lymphatics. Major defense response in first 24 hours is by= Emigration of neutrophils

❖ Lymphatic in tissue inoculated with staph aureus. In the Next 24 hours finding will be= Neutrophilic infiltrate

❖ Pt. with yellowish thick fluid drained from arm during incision drainage. It contains= Neutrophils
  - It is also asked as
    - A patient with wound having yellowish discharge. Which one is related= Neutrophils

❖ Pt. presented with fever and SOB, purulent pleural effusion was found, on microscopy, which one of the following will be found= Increased neutrophils

❖ Which of the following cells is involved in acute inflammatory process and also has myeloperoxidases and other enzymes=Neutrophils

❖ The principal circulating phagocyte in the blood is=Neutrophil

BASOPHILS, EOSINOPHILS AND MAST CELL

❖ Which of the following Cells having cell membrane receptors for IgE and having basophilic granules containing histamine and serotonin= Basophils

❖ Cells that release transform into mast cells n release histamine= Basophils

❖ IgE is present in surface of which cell= Mast cells (mast cells> basophils)

❖ Heparin/histamine released by which cells= Mast cells

❖ Mast cells release which anticoagulant substance= Heparin

❖ Which of the following opioid administration is associated with the release of histamine= Morphine

❖ Asthma and seasonal rhinitis in young patient, which of the following when given will decrease these symptoms=Mast cell stabilizer

❖ In Asthma patient the allergens react directly to=Alveolar mast cells

❖ Which of the following circulates the least in blood stream=Basophils

❖ In sensitized Atopic asthma, antigen binds to=Mucosal mast cells

MONOCYTE AND MACROPHAGES

❖ New vessel proliferation is done by which of these substance from macrophages=PDGF

❖ Foam cell in atheroma are=Monocyte (remember macrophages was not given in option)

❖ At alveolar level, microbicidal function is done by=Alveolar macrophages

❖ Which of the following best describe granulation tissue=Capillary bud and fibroblast

❖ Which is true regarding the inflammatory cells is=Macrophages are the main scavenger at site of inflammation

❖ Major phagocytic cell which presents antigen to lymphocytes is=Monocytes/macrophages

❖ A man had MI and died after 6 days. On autopsy, histological features show which of the following=Macrophages

❖ Macrophages are derived from=Monocytes

❖ Acute Pulmonary congestion due to mitral stenosis. Autopsy will show which of the following in alveoli=Macrophages

❖ A patient died in ER with longstanding pulmonary congestion due to mitral stenosis. On autopsy, the alveoli will be lined by which of the following=Heart failure macrophages

❖ Which of the following is the most Important in immunity in lung alveoli=Alveolar macrophages

❖ Patient dies on 4th day after MI. On histo predominantly= Macrophages

❖ Regarding cells in inflammation= Macrophages are main scavengers at site of Inflammation

❖ Macrophages in immune system act as= Phagocytes (phagocytosis > APC)

❖ A surgeon removed a 10-year-old breast implant, which had leaking. What cells will be seen in this type of inflammation= Giant cells

LYMPHOCYTES

- Most important cells of chronic inflammation=Lymphocytes
- Viral disease, cell line increased=Lymphocytes

EOSINOPHILS

- Which among the following appear with IgE and have got a stain on H&E staining= Eosinophils
- Eosinophils increase in which of the following conditions=Parasitic
- A cell with large granules and larvicidal polypeptides= Eosinophils
- Major cells Involved in hookworm infestation are= release Eosinophilic chemotactic factor
    - Know the difference if asked
        - Hookworm infection microscopic feature on peripheral blood slides= Spectacle shaped nuclei

REMEMBER THIS

- Which of the following cells on peripheral smear are less 1% in body= Pluripotent stem cells> Basophils
- Which of the following circulates the least in blood stream= Pluripotent stem cells > Basophils
    - If no option of pluripotent choose Basophils then
- M bands cells are produced by=Plasma cells
- Which cell line does not have nucleus= RBC
- On microscopic slide of lymphatics, bacteria are found. What will lymphatics do=Infection clearance from lymph by draining

KNOW THE DIFFERENCE:

- Which of the following is largest in size= Megakaryocyte
- Which of the following is the largest cell found in blood= Monocytes
- Which of the following is the largest cell found in bone marrow= Megakaryocyte

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384. IMMEDIATE MEDIATOR OF ALLERGIC REACTION=HISTAMINE

KNOW THE DIFFERENCE.

- Immediate mediator of allergic reaction=Histamine
- Mediators of chronic allergic rhinitis is = eosinophils
- A specific mucosal change pertaining to chronic rhinitis is increase in= Goblet cells
- The Epitheloid cells of a tubercle are derived from= Lymphocytes
- The connective tissue cells that secrete antibodies and typically contain eccentric nuclei are=Plasma cells
- Cells whose principal function is to produce antibodies are=Plasma cells
- Predominant inflammatory cells in allergic and parasitic reaction are= Eosinophils

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385. WHICH CELLS CONTAIN DENSE GRANULE AND HAVE IG E ANTIBODIES ON THEIR CELL MEMBRANE=BASOPHILS

KNOW THE DIFFERENCE.

✓ Dense granule ------Basophils
✓ Granules-----Mast cells
✓ Granules and histaminase enzyme----Eosinophils

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Which cells contain dense granule and have Ig E antibodies on their cell membrane=Basophils
- Which Connective tissue cells have a single membrane bounded and having lamellar vesicles and granules=Mast cells

- Cells having granules and histamine degrading enzyme= Eosinophil histaminase that neutralize histamine

386. A PATIENT TAKING STEROID, DECREASE OF WHICH CELL IS EVIDENT=LYMPHOCYTES

NOTE THE DIFFERENCE.

- Glucocorticoid does not decrease which cell line=Neutrophil

387. FIRST LINE OF DEFENCE IN TISSUES= MACROPHAGES

REMEMBER THESE MCQS

- ✓ The first line of defence against infection in body tissues is= Macrophages
- ✓ First line of defence in blood= neutrophils
- ✓ First line of defence against microbial pathogens= Skin
- ✓ First line of defence in lungs is by= Alveolar macrophages
- ✓ First line of defence against tumor cells is= NK cells
- ✓ First line of defence during bleeding is provided by= Platelets

388. AUTOSOMAL DOMINANT= ONLY 1 PARENT OF AFFECTED CHILD HAVE DISEASE

NOTE THAT

Autosomal Dominant Inheritance	Autosomal Recessive Inheritance	X-Linked Recessive Inheritance
❖ One parent carries a gene (associated with disorder) and the other parent is normal,	❖ The parents of an affected individual are not affected but are gene carriers.	❖ Female parent is carrier and male parent is unaffected
❖ One half of the children are expected to be affected	❖ On average ❖ ¼ of children will be affected (homozygous), ❖ ½ of children will be carriers ❖ ¼ of children will be neither affected nor carriers.	❖ One in two children will be affected ❖ Male children who get the affected x chromosome phenotypically manifest the disorder ❖ Female children are carriers.
❖ Diseases are most Often due to defects in structural genes.	❖ Often due to enzyme deficiencies. ❖ These include most inborn errors of metabolism	❖ Due to Enzyme deficiencies that are exceptions from autosomal recessive pattern

NOW LET'S PRACTICE SOME PAPER MCQ'S

MULTIFACTORIAL

- Common most mode of inheritance= Multifactorial
- Type of genetic disease most frequent is= Multifactorial
- 40-60% of genetic defect are= Multifactorial
- Most appropriate about multifactorial chromosomal abnormality= Trisomy 21
- Most Common mendelian disorders= Autosomal Recessive

AUTOSOMAL DOMINANT & RECESSIVE

- Autosomal dominant= Incomplete penetrance
- Regarding autosomal dominant=50% children will be affected
- Regarding Autosomal dominant disorders=Only one parent of affected child is sufferer

- Autosomal dominant is different from autosomal recessive=Heterozygous is affected
- 50% show disease. 50% are normal; mode of inheritance=Autosomal dominant
- The individuals with autosomal dominant disease who don't express it phenotypically=Incomplete penetrance
- The off spring of affected parents have 50 % chance of developing disease and there is no carrier= Autosomal dominant trait
- In autosomal dominant disease inheritance true is= Only one parent of affected child has the disease
- At counselling the thalassemia minor mother who has a thalassemia major baby. She should be told that the chances of babies being affected with each pregnancy is-= 25% major, 50% minor, 25% normal

X LINKED RECESSIVE

- Which Blood Disease a mother can pass on only to son if she is a carrier= Hemophilia
- A pregnant female carrier of hemophilia, considering it is an x linked recessive, which information will be the most beneficial on Chorionic villous sampling= Cytogenetic abnormalities
- Autosomal recessive disorders like Fanconi anemia, Ataxia telangiectasia are labelled as 'chromosome breakage syndrome' this means=Defective DNA repair

OTHERS

- Which of the following can be transferred from mother to her children= Mitochondrial DNA
- Regarding mitochondrial mutations=Only transmitted from mother
- Mode of maternal inheritance of a disease in a new born is via=Mitochondrial DNA

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389. WHICH ONE OF THE FOLLOWING IS AUTOSOMAL DOMINANT= ACHONDROPLASIA

SOME MCQ'S RELATED TO EXAM AND OTHER POINTS WITH MNEMONICS

AUTOSOMAL DOMINANT DISORDERS: Arrogant Marfan HuNTS Vulnerable Families

- ✓ Adult polycystic kidney disease, Marfan syndrome, Hereditary spherocytosis, Neurofibromatosis, Tuberous sclerosis, Von Hippel-Lindau disease, Familial hypercholesterolemia
- ✓ VWD, hypertrophic cardiomyopathy, Familial Adenomatous Polyposis, myotonic dystrophy, Achondroplasia, Retinoblastoma

AUTOSOMAL RECESSIVE DISEASES:

- ✓ Include inborn errors of metabolism like lysosomal and glycogen storage diseases it includes cystic fibrosis, Thalassemia, Wilson disease, Alpha-1-antitrypsin deficiency

X-LINKED DISEASE: HUNTER Female Living Downtown Got Hemophilia

- ✓ Males - ALWAYS Cases, NEVER Carriers.
- ✓ Females - ALWAYS Carriers, NEVER Cases.
- ✓ Examples: Hunter syndrome, Fabry disease, Lesch-Nyhan syndrome, Duchenne muscular dystrophy. G6PD deficiency, Classic Hemophilia (hemophilia A)

NOW LET'S PRACTICE SOME PAPER MCQ'S

AUTOSOMAL DOMINANT

- Single gene Autosomal dominant= Achondroplasia
- A boy has small upper and lower limb, normal trunk pattern is= autosomal dominant
- Colon carcinoma= autosomal dominant
- Which of following is autosomal dominant disorder=Retinoblastoma
- Which one of the following is autosomal dominant= Adenomatous polyposis
- Which of the following is an autosomal dominant disorder=Hereditary spherocytosis
- Autosomal dominant disorder, choreiform movements, mood disturbances, behavioral changes, disease most likely is=Huntington
- Which of the following is Autosomal dominant neoplasia=Childhood retinoblastoma
- A pt presents with chorea, mental retardation, depression and aggressive behaviour and involvement of single autosomal dominant gene. The likely diagnosis is= Autosomal dominant

- It is also asked as
  - Patient presents with chorea, mental retardation, depression, and memory loss. The mode of inheritance of this disease is= Autosomal Dominant
  - A pt presents with chorea, mental retardation, depression and aggressive behaviour and involvement of single autosomal dominant gene. The likely diagnosis is= Huntington

AUTOSOMAL RECESSIVE

- You have just confirmed the diagnosis of cystic fibrosis in a 3-year-old child. The parents are concerned about future pregnancies. You explain to them that the pattern of genetic transmission of cystic fibrosis is=Autosomal recessive
- Which of following is autosomal recessive disorder=Alpha-1-antitrypsin deficiency

X LINKED RECESSIVE

- Genetic inheritance of Hemophilia A=X linked recessive
- Duchene muscular dystrophy is=X linked recessive
- Which of them have familial occurrence=Duchenne muscular dystrophy is X-linked recessive
- The most common muscular dystrophy=Duchenne x linked recessive

390 12-YEAR-OLD BOY WITH OBESITY HYPERPHAGIA SHORT STATURE MENTAL RETARDATION (SOME OTHER THINGS) = PRADER WILLI

NOTE THAT

- Prader Willi Syndrome = Hyperphagia and Hypogonadism
- Angel-Man syndrome= inappropriate laughter
- Turner syndrome = Hypergonadotropic hypogonadism
- Kallmann syndrome= Hypogonadotropic hypogonadism
  - Kallman's syndrome is a recognized cause of delayed puberty secondary to hypogonadotrophic hypogonadism.
  - Kallman's syndrome is thought to be caused by failure of GnRH-secreting neurons to migrate to the hypothalamus----Lesion of Arcuate nucleus
  - The clue given in MRCP AND USMLE many questions is lack of smell (anosmia) in a boy with delayed puberty

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Damage to arcuate nucleus of hypothalamus results in = Kallmann syndrome
- GnRH is released from= arcuate nucleus
- Prader Willi syndrome associated with= decreased GH
- Which one of the following is associated with Kallmann syndrome= Hyposmia

391. WHICH OF FOLLOWING IS THE COMMON COMPLICATION OF TOTAL PARENTERAL NUTRITION= HYPERGLYCEMIA

ALSO NOTE THAT

- Patient was on TPN and he had purpura. What is the reason= Vit K deficiency
- TPN is contraindicated in= Uncontrolled DM (Uncontrolled DM > Liver failure)
- Nutritional requirement of body includes=Fats, protein and carbohydrates
- A ICU pt with CVP line in subclavian vein for the past 10 days is on parenteral nutrition. He develops fever, blood CP shows clusters of gram +ve cocci. DOC for this organism is=Vancomycin
- A lady who had colostomy was started on total parenteral nutrition (TPN). TPN included problem will be=Hyperglycemia
- Nutritionist will advise intake of which food for vitamins=Green Vegetables

392. SEVERELY BURNT, HYPO PERFUSION, SHOCK AND INCREASE VISCOSITY AFTER 24HRS DUE TO= LOSS OF PROTEIN

SOME PAST PAPER MCQS ABOUT BURNS

- In 40% deep burn cases, ion lost causing decrease action potential is= Hyponatremia
- After burn which major complication will most likely develop= Contracture
- In burns, which protein becomes deficient= Albumin
- Metabolic derangements common to patients with burns= Hyponatremia
- Nutritional assessment in a burn patient is done by= Albumin
- Increase viscosity due to burn due to= Loss of proteins
- A patient with 40% burn injury develops edema. Cause of edema will be= Hypoalbuminemia
- Case of burns in which skin graft not needed decided on= skin appendages
- An athlete presented with 3rd degree burn, he is likely to develop= Contracture
- In burn patient, fever, hypotension and bleeding diathesis. What is the diagnosis= DIC
- Burn patient scenario was given, in correction of hypokalemia, IV K is given. K enters the cell via= Na k ATPase
- A patient with severe burn develops edema of whole body and blood oozing from capillaries in skin Cause of edema is=Albumin deficiency
    - It also comes as
        - Patient with severe burn came to ER. O/E he has edema which is most likely due to= Capillary permeability
- At which temperature hot and burning sensation of skin is felt=45C
- A pt with 40% burn. There is loss of water and electrolytes. Which of the following electrolytes abnormality will be present associated with low-voltage of action potential= Hyponatremia
- The most common non-bacterial opportunistic organism recovered from burns is=Candida
- A person brought in ER had burns he was admitted, later on he developed fever and bleeding diathesis. He is most likely suffering from=DIC
- A Man with 70% burns in ICU develops bleeding, diathesis, hypotension and tachycardia. What is the diagnosis=DIC
- Skin burn prevention of contraction=Glucocorticoid
- Ketamine is used as anesthetic in-repeated dressing of burn patients because=It has profound analgesic effects
- Young child, hx of burn, got treatment, after 24 hours he developed edema due to=Endothelial retraction (Ref: Robbins Basic Pathology page 33-chapter 2 inflammation and repair By Vinay Kumar, Abul K. Abbas, Jon C. Aste)

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393. ONE OF THE FOLLOWING IS THE DIFFERENTIATING FEATURE BETWEEN KWASHIORKOR AND MARASMUS= PRESENCE OF BILATERAL PITTING OEDEMA

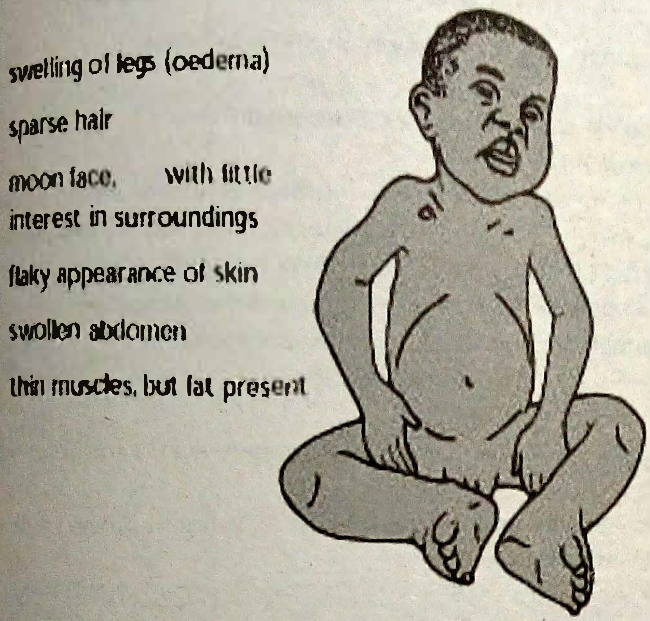
REMEMBER ABOUT PROTEIN-ENERGY MALNUTRITION

Kwashiorkor	Marasmus
Protein malnutrition resulting in skin lesions, Edema due to ↓ plasma oncotic pressure liver malfunction (fatty change due to ↓apolipoprotein synthesis).	Marasmus is protein energy malnutrition (PEM) not causing edema Diet is deficient in calories but no nutrients are entirely absent
Moon face	Old man appearance
Mild retardation	Severe retardation
Abdomen is protuberant	Abdomen in shrunken
Clinical picture is small child with swollen abdomen	Clinical picture is that of a child who looks like an old man

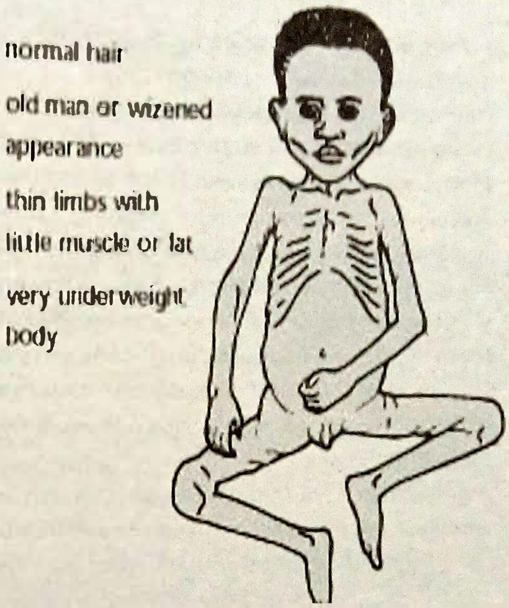
- Mnemonic: Kwashiorkor results from protein deficient **MEALS**:
  - **M**alnutrition
  - **E**dema
  - **A**nemia
  - **L**iver (fatty)
  - **S**kin lesions (hyperkeratosis/ hyperpigmentation)

- Mnemonic: **Ma**rasmus results in **Mu**scle wasting

kwashiorkor


swelling of legs (oedema)
sparse hair
moon face, with little interest in surroundings
flaky appearance of skin
swollen abdomen
thin muscles, but fat present

marasmus


normal hair
old man or wizened appearance
thin limbs with little muscle or fat
very underweight body

NOW LET'S DISCUSS SOME PAPER MCQ'S

- A 6-year-old boy presents in the OPD with apathy, peripheral edema, enlarged liver, low serum albumin and moderate anemia. The most likely nutritional disorder is= Kwashiorkor
- A 4-year girl with no congenital anomaly presents with edematous body and distended abdomen. O/E hepatosplenomegaly, brittle shiny weak hair, hyperpigmentation, desquamation was noted. What is the most likely diagnosis= Kwashiorkor
- A patient with severe malnutrition presented with jaundice, generalized edema, and ascites. The massive accumulation of fluid in the abdomen is the result of = Decreased albumin
- One of the following is NOT the feature of Malnutrition in the elderly = Thrombocytopenia
- A 4-year child with thin lean body and distended abdomen. O/E hepatosplenomegaly, brittle shiny weak hair. What is the most likely diagnosis? = Kwashiorkor
- Parents brought their child with complaints of edema, apathy, and pigmentation. The likely diagnosis is = Kwashiorkor

REMEMBER THESE MCQS, DON'T GET CONFUSED WITH PROTEIN ENERGY MALNUTRITION DISORDERS

- Bleeding gums, altered resistance to vessel (fragile vessels) are the signs of= Scurvy
- A 11-month baby brought by mother with complains that the baby is semi-unconscious and listless. O/E no response to vocal stimulation, weight 60% of age and a small purple contusion is found on his thigh. What is the probable diagnosis= Physical abuse

CARDLE DISEASE OCCURS DUE TO DEFICIENCY OF= MUSCLE GLYCOGEN PHOSPHORYLASE

REMEMBER

Disorder	Enzyme Deficiency	Accumulation
Von Gierke disease (type I glycogenosis)	Glucose-6-phosphatase	Glycogen
Pompe disease (type II glycogenosis)	α-1,4-glucosidase	Glycogen
Cori disease (type III glycogenosis)	Amylo-1,6-glucosidase	Glycogen
McArdle syndrome (type V glycogenosis)	Muscle phosphorylase	Glycogen

NOW LET'S DISCUSS SOME PAST PAPER MCQ'S

- Hypoglycemia in Von Gierke disease occurs due to deficiency of which of the following enzymes=Glucose 6-phosphatase
- Patient of Von Gierke, which diet you restriction you would advise= Carbohydrates
- Urine smell of burnt sugar= Maple Syrup urine disease
- Maple syrup urine disease is due to an inborn error of metabolism in = Branched-chain amino acids
- A child with easy fatigability, muscle cramps, low lactate, and high glycogen likely has = McArdle disease
- A dietary restriction for a patient with von Gierke disease should be = Carbohydrates.
- Hypoglycemia in Von Gierke disease is caused by a deficiency of = Glucose-6-phosphatase
- Von Gierke disease is due to a deficiency of which enzyme? = Glucose-6-phosphatase
- McArdle disease occurs due to deficiency of= Muscle glycogen phosphorylase
- Diet management for a child with McArdle syndrome is= Low carb
- Child with hx of easy fatigability, muscle cramps, low lactate and high glycogen level is suffering from= McArdle disease
- A girl with coarse facial features, gap between incisors and spade like hands. What happens when muscles get involved in this disease= Increase Muscle mass
  - It also comes with different options
    - Girl with coarse facial features, gap between incisors and spade-like hands, what happens to muscles involved in this disease= Enlargement

395. GROWTH FACTORS AT CELL BRING ABOUT ITS EFFECTS BY WORKING ON RECEPTORS LOCATED AT= CELL MEMBRANE

NOTE THE FOLLOWING ABOUT RECEPTORS

- In dehydration, thirst is stimulated by sensory receptors present in= Angiotensin 2
- Receptors act as transducers= By increasing response to repeated stimulus
- The receptors which are stimulated by movement and change in position are= Proprioceptors
- A person doing regular exercise. What factor in this condition increase his respiratory rate= Proprioceptors
- Gastric acid secretion is mediated by=H2 Receptors
- Oxytocin given to female but she is not responding to it. This is likely due to= Less receptors in myometrium
- High affinity for receptors= Free Tri-iodothyronine
- The part of spinal gray matter receiving noxious stimulus is= Lamina I
- Stimulus for high threshold mechanoreceptor is received by= Lamina II (substantia gelatinosa)
  - Low-threshold mechanoreceptors terminate in laminae 3 and 4, whereas high-threshold Nociceptors terminate in laminae 1 and 2 and in 5----most C-fibers terminate in lamina II and they are exclusively related to high threshold mechanoreceptors
- Drug receptors= Protein in nature

396. GREATEST BLOOD FLOW PER 100GRM TO WHICH ORGAN= KIDNEY

REMEMBER

- Max blood flow at rest= liver (1500ml) and kidneys (1260 ml)
- Max blood flow/ 100gm at rest= carotid bodies and kidney
- Organ which removes 70-80% oxygen of its arterial supply at rest= Heart
- During exercise, there is decreased blood flow to= Kidney (kidney > splanchnic---if kidney is not in option prefer splanchnic)

TRUE REGARDING MEIOTIC DIVISION IS= PROPHASE IS LONGEST

REMEMBER

Interphase	❖ Gap 1 (G1 phase) o Cells increase in size in Gap 1. o Ensures that everything is ready for DNA synthesis. ❖ Synthesis phase (S phase): o DNA replication (DNA synthesis) occurs during this phase o Chromosome replication ❖ Gap 2 (G2 phase): o G2 is interval between DNA synthesis and mitosis. o Most radiosensitive along with mitosis phase
Mitosis phase	❖ Mitosis is a process in which parent cell divides into two new daughter cells. ❖ The daughter cell contain same number and type of chromosome as in parent cell. ❖ It has the following stages o Prophase: ➢ The chromosomes of the nucleus become condensed into well-defined chromosomes. ➢ Nucleolus within the nucleus dissolves ➢ Chromosomes first visible with parallel chromatids o Prometaphase: ➢ Nuclear membrane is disrupted giving microtubules access to the chromosome. ➢ Kinetochores assemble at each centromere on the chromosome. ➢ Certain microtubules bind to kinetochore o Metaphase: ➢ Attached microtubules start pulling chromosomes towards opposite ends of the cell. ➢ The resulting tension causes the chromosomes to align at the metaphase plate. ➢ Thickest chromosomes ➢ Best chromosome study ➢ Chromosomes arranged themselves on spindle fibers o Anaphase: ➢ The kinetochores separate, and chromosomes moves to opposite side o Telophase: ➢ Reversal of prophase and Prometaphase events. ➢ The nuclear envelop re-forms. ➢ Chromosomes decondense or relax to form chromatin. ➢ Mitosis is complete. Each daughter nucleus has an identical set of chromosomes ➢ Chromosomes with two chromatids

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- True regarding meiotic division is=Prophase is longest
- Chromosomes align at equatorial plate in which phase of cell cycle=Metaphase

- In which phase of cell cycle cell has double chromatids=Telophase
- During cell division, chromosome arranges in equator during=Metaphase
- Cell division consists of mitosis and meiosis. In mitosis when centromere of each pair gets attached to a spindle fiber and then centromeres divide. This occurs during which of the following stage= Metaphase
- Chromosome with 2 chromatids seen in=Telophase
- Karyotyping occurs in which phase of cell cycle=Metaphase
- In which phase of cell cycle are sister chromatids arranged as parallel=Prophase
    - It also comes as
    - In mitosis, the chromosome consists of two parallel subunits, chromatids during= Prophase
    - In which phase of cell division, chromosomes are arranged in parallel chromatids= Prophase
- DNA replication takes place during=S phase
    - It also comes as
    - Replication of DNA in a normal mitotic division occurs in= Interphase
- A person had a blunt penetrating wound into abdomen. During healing, all cells enter G1 phase except one which remains in G0 phase. Which one of following remains in G0=Skeletal muscle cells
- A 17-year-old driver of a pickup truck is involved in a collision. He incurs blunt force abdominal trauma. In response to this injury, cells in tissues of the abdomen are stimulated to enter the G1 phase of the cell cycle from the G0 phase. Which of the following cell types is most likely to remain in G0 following this injury= Skeletal muscle

398. RESPIRATORY SYMPTOMS ARE CHARACTERISTIC OF ONE OF THE FOLLOWING CONDITIONS = ASCARIASIS

NOTE THE FOLLOWING MCQS ABOUT CHARACTERISTIC FEATURES

- The most characteristic finding of sarcoidosis in female is= Erythema nodosum
- Characteristics sign of penicillin allergy is= Bronchospasm
- Which of the following will show characteristics of upper motor neuron lesion in cortex= Hyperreflexia
- Significantly raised AFP is characteristic of= Hepatocellular Ca
- Characteristic feature of hemophilia is= Hemarthroses
- Characteristic of nucleus=Euchromatin is transcriptionally active to form rDNA
- Characteristic of right ventricle= Origin of Pulmonary trunk
- An old lady with Cushing syndrome. What will be characteristics features present= Purple bluish abdominal striae
- Characteristic sign of cerebellar disease is= Dysdiadokokinesia
- An adult complaining of dyspepsia and loss of appetite with h/o alcohol consumption. Liver biopsy revealed alcoholic liver disease. The likely characteristic feature seen on biopsy will be= Mallory bodies

399. ULCER DUE TO HYPERTENSION = MARTORELL

REMEMBER

- Ulcer due to hypertension= Martorell
- Ulcer caused by anaerobic staphylococcus= Meleny's ulcer
- Ulcers due to Skin burns= Marjolin
- Ulcer caused by a non-hemolytic anaerobic or microaerophilic streptococcus is
- Called= Meleney's ulcer
- The edge of a tuberculous ulcer is usually: = Undermined

400. A PERSON WITH ETT, HEAT LOSS IS BY= EVAPORATION

REMEMBER FOR HEAT LOSS

- Person uncovered = conduction + Radiation
- Only humidity mentioned= convection
- Only temperature mentioned= radiation
- Endotracheal Tube mentioned= Evaporation

NOW LET'S PRACTIC

- High tem
  body= Ra
  Evaporat
- A man ly
  from boc
  Evaporat
- Immedia
- Which o
- Loss of
- A naked
  and cor
- Heat los
- A 19-ye
  120bpn

401. HOW DIFFE

NOTE

- Cytoke
- Dark st
- Leucoc

NOW LET'S PRACTICE SOME PAPER MCQ'S

- High temperature in the external environment will activate which mechanism to transport heat out of the body= Radiation
- Evaporative and non-evaporative heat loss is controlled by= core body temperature
- A man lying naked at operation table with room temperature 21.5 C" by which mechanism heat transfer from body= Radiation and conduction
- Evaporation gradient is monitored by= Thermal gradient
- Immediate heat loss is through= Cutaneous vasodilation
- Which of following cause heat loss= Vasodilation
- Loss of water by evaporation and insensible loss from body= Depends on core body temperature
- A naked person in an AC room with temp 21, humidity 80 percent. Heat loss will be through= Radiation and conduction
- Heat loss through evaporation and non-evaporation depends on= Core body temperature
- A 19-year boy working in a well-ventilated room started sweating profusely. O/E BP was 140/80, pulse 120bpm at a room temperature of 26°C. The most likely cause is = Mental stress

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401. HOW DIFFERENTIATION IS DONE AT MYELOCYTE STAGE= STAINING OF GRANULES

NOTE

- Cytokeratin staining useful= Neoplasm to determine it as cancer
- Dark staining cells= Basophils
- Leucocytes identified during their maturation by= Different staining of granules

IMMUNOLOGY

402. DIPHTHERIA VACCINE REACTION = TYPE 3

- Remember hypersensitivity reactions are of four types (Mnemonic----ACID)
  - Anaphylactic and Atopic (type I),
  - Cytotoxic (antibody mediated, type II),
  - Immune complex (type III),
  - Delayed (cell mediated, type IV) (ACID).
- Types I, II, and III require the active production of antibody by plasma cells (terminally differentiated B cells).
- Type IV is mediated by the interaction of T cells and macrophages

Hypersensitivity Type	Examples
Type I (immediate or anaphylactic) First (type) and Fast (anaphylaxis)	❖ Hay fever ❖ Allergic asthma ❖ Hives ❖ Anaphylactic shock
Type II (antibody-mediated or cytotoxic)	❖ Autoimmune-hemolytic anemia ❖ Immune thrombocytopenic purpura ❖ Transfusion reactions ❖ Hemolytic disease of the newborn ❖ Goodpasture syndrome ❖ Rheumatic fever ❖ Hyperacute transplant rejection ❖ Myasthenia gravis ❖ Graves' disease
Type III (immune complex)	❖ Serum sickness (diphtheria toxoid) ❖ Arthus reaction ❖ SLE ❖ Polyarteritis nodosa ❖ Post streptococcal glomerulonephritis
Type IV (cell-mediated)	**6 T'S** ❖ T-cells ❖ TB skin test (Tuberculin reaction/PPD) ❖ (Touch) contact dermatitis (e.g. poison ivy, nickel allergy) ❖ Transplant rejections ❖ Type-1 DM

NOW LET'S DISCUSS SOME PAPER MCQ'S

TYPE-1

- A boy presents with urticaria, rhinitis, eczematous rash on extensor surface. The underlying pathology is=Type 1 hypersensitivity
- Urticarial rash type of hypersensitivity= Type 1
- Type one hypersensitivity reaction caused by= IgE
- Type 1 hypersensitivity reaction is mediated by=Mast cell

- A lady with urticaria was given IM adrenaline for type 1 hypersensitivity. Blood samples were taken, which of the following will be raised=IgE
- What type of hypersensitivity cells are involved with Bee sting=IgE
- A young patient with Hx of bee sting develops pruritus urticaria and wheezing within few minutes. The effector cell of this type of hypersensitivity are=Mast cells

TYPE-2

- Myasthenia gravis shows which type of hypersensitivity=Type 2
- Patient develops reaction within 15 mins of transfusion? What type of reaction has occurred= type 2
- Hydrops fetalis occurs to RH –ve mother and RH +ve father. What type of hypersensitivity reaction is it=Type 2
- The type of hypersensitivity reaction that occurs in Graves' disease is=Type 2
- Type of hypersensitivity reaction in Erythroblastosis fetalis= Type 2
- The principal difference between cytotoxic type 2 and immune complex types 3 hypersensitivity is= The site where antigen antibody complexes are found
- Type of hypersensitivity reaction in Myasthenia gravis= Type 2
- A big scenario patient having autoimmune hemolytic anemia. Which type of hypersensitivity= Type 2
- Aplastic anemia patient receives RBC transfusion. After 15 minutes, he develops shortness of breath and dyspnea. Cause= Type II hypersensitivity
- Goodpasture shows which type of hypersensitivity= Type 2
- A patient presents with hemoptysis and hematuria. Workup reveals crescentic glomerulonephritis and positive anti-GBM antibodies. The type of HSV causing it is = Type 2.

TYPE-3

- Type of hypersensitivity in Arthus reaction= Type 3
- Type of hypersensitivity reaction in post streptococcal glomerulonephritis= Type 3
- Type of hypersensitivity reaction in diphtheria toxoid= Type 3
- Example of a type 3 hypersensitivity reaction is=Post streptococcal glomerulonephritis
- 2 yr old boy had been given diphtheria toxoid vaccination. 2 days later he developed symptoms and sign of hypersensitivity. Which type of reaction has occurred=Type 3
- An example of Type 3 hypersensitivity is=Farmer lung
- A girl develops fever, rash and joint pains after diphtheria toxoid vaccine 2 weeks ago. Most likely cause is=Type 3
- Example of type 3 hypersensitivity= Post streptococcal glomerulonephritis
- Serum sickness which occurs after 5 – 10 days of giving a drug= Type 3 hypersensitivity
- Girl develops fever, rash and joint pains. History of diphtheria toxoid vaccine two weeks ago. Cause= Type III
- A young man with aplastic anemia was given Anti thymocyte Globulin. There was no immediate reaction. 10 days later he developed fever, urticarial, arthralgia, generalized lymphadenopathy. The pathophysiology of these symptoms will explain= Type III hypersensitivity
- Patient had vaccine against diphtheria 2 weeks back, now presented with joint pain, fever and rash. Type of hypersensitivity that had occurred= Type III hypersensitivity
- Arthus reaction type III hypersensitivity
- Type of hypersensitivity example= Hypersensitivity pneumonitis (farmer)
- Type of hypersensitivity reaction in acute post-streptococcal glomerulonephritis = Type 3
- A 7-year-old school-going boy develops sore throat. He received antibiotic for it, which resolved it. 2 weeks later he developed generalized body edema, hypertension and hematuria, glomerulonephritis with granular deposits in the membrane. The type of hypersensitivity is? = Type 3

TYPE-4

- Type of Hypersensitivity in Hashimotos thyroiditis is=Type 4
- The type of hypersensitivity involved is after TB vaccine given is=Type 4

- A man was hiking and noticed a rash appeared on his arm which was not covered by clothing. The rash grew in size for 2 days and then subsided after 2 weeks. Which of the following reaction took place in this person= Type 4 hypersensitivity
- A person is given S/C injection of PPD (purified protein derivative). He has induration with firm raised margins at 60 hours. What will be the type of reaction= Type IV hypersensitivity

DRUGS

- Absolute contraindication of Propofol=Hypersensitivity reaction
- Amoxicillin injected and shock condition= Hypersensitivity 1
- Hypersensitivity reaction after penicillin. Treatment= Epinephrine
- Most specific manifestation of penicillin hypersensitivity is=Bronchospasm
- Young boy came to ER after a bee sting. Inj. Adrenaline was given in order to suppress= System anaphylaxis

OTHERS

- Seafood allergy presenting with pruritic blotchy areas is likely due to? = Localized anaphylaxis
- A patient who had kidney transplantation develops cyanosis and organ failure within 10 minutes. What is the likely etiology=Antibody mediated rejection
- 10 min after a renal transplant the transplanted kidney became cyanosed and failed to function. The pathogenesis is best explained by=Antibody mediated rejection
- Washed RBCs are beneficial in=Prevent hypersensitivity
- Itching in scabies is caused by=Hypersensitivity to mite protein
- Delayed hypersensitivity cytokine=IL 2
    - Note: Th1 cells predominantly produces IFN and IL-2 AND Th1 cells are predominantly involved in delayed hypersensitivity reaction
- In scabies, severe itching is due to= Hypersensitivity to mite protein
- Erythroblastosis fetalis hypersensitivity= Antibody Mediated
- Delayed hypersensitivity cytokines= IL-2
- In delayed hypersensitivity reaction which type of antibodies are involved= none
    - Note--------As it is cell mediated, not antibody mediated
- Which of the following cells participate in the induration in Mantoux test=T lymphocytes

REMEMBER THIS

- Schwartzman reaction is mediated by= Endotoxins > Foreign body

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403. BCG VACCINATION INFERS IMMUNITY THROUGH= CD4 CELLS MEDIATED DELAYED HSR

REMEMBER ABOUT B AND T-CELLS

B- cells	T-cells
❖ Differentiate in the bone marrow and peripherally (B cells= Bone marrow)	❖ Differentiate in the thymus (T-cells= Thymus)
❖ The presence of surface immunoglobulin is characteristic	❖ No surface immunoglobins
❖ Humoral immunity	❖ Cell mediated immunity

Further subdivided into

- **CD4+ T cells**
    - About 60%
    - Associated with MHC-II
    - Help B cells make antibodies and produce cytokines to recruit phagocytes and activate other leukocytes.
- **CD8+ T cells**
    - About 30%
    - Directly kill virus-infected cells.
    - Responsible for destroying tumor
    - Associated with MHC-I

Rule of 8: MHC II × CD4 = 8; MHC I × CD8 = 8.

NOW LET'S PRACTICE SOME PAPER MCQ'S

- 50 years lady received a renal transplant from a cadaver. One month later renal failure s/s were seeming some biopsy findings pointing to HLA1 association, which cells are involved= CD8
- Which of the following has anti-tumor immunity= CD8 + cytotoxic T-lymphocyte killing
    - (Remember CD8+ cells and NK cells are both anti-tumor--- CD8+ > NK cells)
- Primary response against graft rejection= Cytotoxic T cells
- Defense against melanoma= cytotoxic T cells
- T cells need to bind with what to access antigen= With MHC
- Which of following cells has activity against cancer cells & prevents carcinogenesis= Cytotoxic T cells
- Regarding super antigen= causes cytokine storm from T cell
- Regarding MHC-1= Present on chromosome 6
- Acute Transplant rejection due to= CD 8 cells
- Which molecule when absent causes the loss of anti-tumor activity of immunity=MHC 1 (Ref: first aid Ed 2017 pg.: 96)
- Chronic transplant rejection involves which of the following cells= CD4 positive T lymphocytes
    - Note
        - CD8+ T cells from graft directly damage host cells.
        - Cytokines from graft CD4+ T cells recruit macrophages, which damage host cells.
    - Or remember it as
        - Acute Rejection → CD 8
        - Chronic Rejection →CD 4
- HLA typing in renal transplant decreases activation of= CD8
- Regarding MHC, human major histocompatibility complex, correct statement is= Composed of HLA genes
- A cytokine produced by T cell that induces MHC 2 production is= Interferon gamma
- The antigen processed by the exogenous epitope presentation pathway are presented with which one of following= MHC class 2
    - Endogenous --- MHC-1
    - Exogenous --- MHC-2
- T cells that have a low affinity for MHC class 1 molecule differentiate in the thymus to become one of the following type of cell= CD 8
    - It is also asked as
        - Antigen presenting TH1 cells present the antigens with= CD8
- DM patient HLA 1 had transplant one month ago. Which cells involved in rejection= CD 8 with MHC 1
    - The other option in this question were CD4 with MHC 1---which cant be bcz CD4 is associated with MHC 2-----see above theory

404. **A PPD TUBERCULIN TEST DONE TO A PATIENT. AFTER 40 HOURS, 15 MM ERYTHEMA IS NOTICED. CELLS RESPONSIBLE FOR ERYTHEMA ARE= HELPER T CELLS**

405. **A PPD TUBERCULIN TEST DONE TO A PATIENT. AFTER 40 HOURS, 15 MM ERYTHEMA IS NOTICED. CELLS RESPONSIBLE FOR ERYTHEMA ARE= CD 4 CELLS**

NOTE:

- In above both questions sometimes a direct Helper T cells option is given and sometimes you are given an option of choosing between CD4 or CD8---prefer CD4 cells

FOR THIS REMEMBER

- CD8+ becomes → Cytotoxic T-cells
- CD4+ becomes → helper T-cells
- Memory T cells may either be CD4+ or CD8+.

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406. **REGARDING HLA ANTIGEN=IT IS THE MAIN REASON FOR GRAFT REJECTION**

FEW PAST PAPER QUESTIONS RELATED TO HLA

- A patient has to undergo renal transplantation. Which of the following tissues should be sent for HLA typing = WBC
    - It also comes as
        - HLA sampling, best is = WBCs
        - HLA compatibility between donor and recipient is best detected by = WBCs
- Prerequisite for renal transplant = HLA matching
    - It also comes as
        - The most important pre-requisite for renal transplantation = HLA matching
        - In renal transplantation, the single most significant test = HLA
- Main response for graft rejection is by = HLA

GRAFT REJECTION AND IMMUNE RESPONSE

- Antigens responsible for graft rejection belong to one of the following = Histocompatibility antigen (HLA) system
- Human leukocyte antigens (HLA) are = Most common cause of graft rejection
- HLA matching is important because it decreases chances of which immunological condition = Graft vs. Host Disease
- A child has bone marrow transplanted from a sibling who has 5/6 of HLA matched donor now developed rash and diarrhea. What other related finding are to be present in this patient = Hyperbilirubinemia
- Antigen-presenting cells that activate helper T cells most likely express processed antigen on their surfaces in association with = Class II HLA antigens
- HLA (II) typing of tissue done before organ transplant to prevent = Lysis of CD4+
- A female patient with chronic renal failure has 5 people who are willing to serve as a donor for renal transplant. Her husband, identical twin, half-brother, sister, and son. The most suitable donor for her will be = Identical twin
- Regarding grafts between genetically identical twins = Are not rejected even without immunosuppression

HUMAN MAJOR HISTOCOMPATIBILITY COMPLEX (MHC)

- Regarding the human major histocompatibility complex (MHC), it is = Composed of HLA genes
- Regarding the human major histocompatibility complex (MHC), the most likely feature is = Is composed of human leukocyte antigen (HLA) genes

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LIKE RECEPTORS ARE ASSOCIATED WITH=INNATE IMMUNITY

PAST PAPER MCQS RELATED TO IMMUNOLOGY

- Most common manifestation of autoimmune disease is=hematological changes
- CD in immunology stand for=Cluster of differentiation
- Which one is an indication for passive immunity=When you do not have enough time for active immunity
- You will prevent Tetanus in a population by giving=Tetanus Toxoid
- Passive immunity is achieved by=IV immunoglobulin
    - It also comes as
        - Passive immunity is achieved by=Injecting T lymphocytes
- Cells responsible for innate immunity are activated most commonly by=Carbohydrate sequences in bacterial cell walls

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408. REGARDING THE MECHANISM OF FEVER IN ACUTE INFLAMMATION IS TRUE IS= IL-1 INDUCE PRODUCTION OF PGE2 WHICH INCREASE THE SET POINT.

ALSO NOTE THAT

- Mechanism of fever in infection= Through activation of complement system
- Adult respiratory distress syndrome is most closely associated with= Complement fixation

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409. DISEASE OF THE SPINE WHICH LEADS TO FUSION OF VERTEBRAE I.E. ANKYLOSING SPONDYLITIS IS ASSOCIATED WITH WHICH HLA TYPE= HLA B27

REMEMBER THE MNEMONICS FOR HLA DISEASES

B27 (PAIR)	**P**soriatic arthritis, **A**nkylosing spondylitis, **I**BD-associated arthritis, **R**eactive arthritis	**PAIR**. Also known as seronegative arthropathies
DQ2/DQ8	Celiac disease (**gluten** sensitive enteropathy)	I ate (**8**) too (**2**) much **gluten** at **D**airy **Q**ueen
DR2	**Multiple** sclerosis, **hay** fever, SLE, Good**pasture** syndrome	**Multiple hay pasture**s have **dirt**.
DR3	Diabetes mellitus type 1, **SLE**, Graves' disease, Hashimoto thyroiditis, Addison disease	2-3, S-L-E
DR4	**Rheum**atoid arthritis, diabetes mellitus type 1, Addison disease	There are **4** walls in a "**rheum**" (room).
DR5	Pernicious anemia → vitamin B12 deficiency Hashimoto thyroiditis	

NOW LET'S DISCUSS SOME PAPER MCQ'S

- HLA B27 is associated with= Ankylosing spondylitis
- HLA-B27 is associated with=Reiter's syndrome
    - Previously, reactive arthritis was sometimes called Reiter's syndrome
- HLA DR4 is associated with = Rheumatoid arthritis
- HLA-B5 is associated with= Behcet's disease
- Aortic insufficiency associated with = Ankylosing spondylitis
- HLA B27 associated eye disorder is = Anterior uveitis
- HLA-B5 is associated with = Behcet disease
- HLA DR4 association is seen in one of the following autoimmune diseases= Rheumatoid Arthritis
- People with certain HLA types seem more likely to develop certain non-infectious diseases. A form of arthritis of the spine called ankylosing spondylitis is often found with: = HLA-B27
- Regarding systemic lupus erythematosus, the following are correct EXCEPT: = The risk is increased by inheritance of HLA-B27
- The HLA cluster of genes is located on the short arm of chromosome: = 6

- The least likely feature of systemic lupus erythematosus is: = The risk is increased by inheritance of HLAB27
- The most appropriate investigation for ankylosing spondylitis = HLA-B27

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410. **AT BIRTH PRESENCE OF WHICH IMMUNOGLOBINS INDICATES INTRAUTERINE INFECTION IN NEONATE=IGM**

FOR ABOVE QUESTION REMEMBER THIS AS

IgA	IgG	IgM	IgE
❖ Released into secretions (tears, saliva, mucus) and breast milk.	❖ Smallest ❖ opsonizes bacteria, neutralizes bacterial toxins and viruses.	❖ Largest ❖ (Macro= IgM)	❖ Binds mast cells and basophils
❖ Most produced antibody overall, but has lower serum concentrations	❖ highest serum concentration (maGor=IgG)		❖ Lowest serum concentration
❖ Produced in GI tract (e.g., by Peyer patches) and protects against gut infections (e.g. Giardia)	❖ Warm antibody	❖ Cold antibody	
	❖ Crosses placenta (Gestation=IgG)	❖ Early or primary immune response (iMMediate=IgM)	

NOW LET'S SOLVE SOME PAPER MCQ'S

IGA

- Major component of which immunoglobulin is present in secretions= Ig A
- Percentage of IgA in secretions? = 70%
- Immunoglobulin abundant in tears is=Ig A
- Mothers milk is abundant in? = IgA
- The most common primary immunodeficiency disease is = Isolated IgA deficiency
- In IgA nephropathy, the histopathological report will be consistent with: = increased mesangial matrix.
- A 45-year-old man has been plagued by mild chronic diarrhea and increased numbers of minor respiratory tract infections. Which of the following diseases is he most likely to have? = Selective IgA deficiency

IGM

- Which of the following is a Pentamer immunoglobulin = IgM
  - It also comes as
    - Pentamer with 10 oxygen binding sites = IgM
- Which of the following is the characteristic of IgM = It is the largest molecule
  - It also comes as
    - Which of the following immunoglobulins is the largest = IgM
- Most important feature of IgM is = First to rise in an infection
  - It also comes as
    - What type of antibody is produced first against a bacterial Infection, is very effective at activating complement, and is too large to cross the placenta = IgM
- Which of the following does not cross the placenta easily = IgM

- Immunoglobulin involved in complement fixation is = IgM (IgM > IgG---& IgG3 > IgG1 > IgG2 > IgG4)
  - It is also asked as:
    - Which of the following immunoglobulins causes complement fixation = IgG3
- When will you terminate pregnancy with rubella = IgM
  - It also comes as
    - Which of the following in maternal serum for rubella should be an indication for termination of pregnancy = IgM
    - To check for acute infection in a baby by ELISA, the antibody will be = IgM
- A 26-year-old obstetric patient becomes acutely ill during her first trimester with infectious mononucleosis-like symptoms, but her heterophil antibody test was negative. A careful history reveals that the family has two cats, and lab tests indicate the expectant mother is infected with *Toxoplasma gondii*. Months later, the woman delivers a full-term baby with no obvious signs of infection with the protozoan. The best test to diagnose acute infection in the neonate would be a parasite-specific ELISA for the most likely isotype of immunoglobulin = IgM.

IGG

- New-born child with repeated infections. Hematologist see decrease in= IgG
  - It also comes as
    - A child with recurrent infection will have which of the following physiological antibody missing =IgA
    - So for newborn= IgG, For Child= IgA
- Long-term memory immunoglobulin is = IgG
- Which immunoglobulin is present in large concentration in serum = IgG
  - It also comes as
    - The highest percentage of serum immunoglobulin is = IgG
    - The most abundant immunoglobulin in the serum of an adult is = IgG
- An IgG2 molecule is composed of = Two gamma2 chains and two kappa chains
- The antibody released against previously exposed antigen is = IgG
- A newborn baby reported with a recurrent infection problem. Her pediatrician consulted the hematologist, and it was concluded that one of the physiological antibodies is missing as seen in the blood serum reports. What is the most likely antibody? = IgG
- Antibody which works best with complement system for opsonization = IgG
- Autoimmune pancreatitis occurs due to = IgG
- Immunoglobulin that crosses the placenta is = IgG
- A newborn baby has blood group A+ and her mother has blood group B-, which results in hemolytic disease of the newborn. Which antibody is the culprit for this condition of the newborn? = IgG
- A Rh –ve female gives birth to Rh +ve baby. The baby develops severe hemolytic anemia and requires urgent blood transfusion. Which antibody would have crossed the placenta causing this condition? = IgG
- The immunoglobulin type involved in Rh incompatibility is = IgG
- Which antibody is present in Erythroblastosis Fetalis = IgG
- Erythroblastosis fetalis is caused by = Anti-D IgG
- Immunofluorescence showing antibodies with IgG at dermo-epidermal junction is due to = Trapping of immune complexes
- Goodpasture's syndrome is closely associated with = Peripheral linear IgG deposits by immunofluorescence
- A young female of 25 years of age reported to a physician because of weakness and fatigue of skeletal muscles, especially extraocular and facial muscles. She was diagnosed with myasthenia gravis. The type of antibodies acting against acetylcholine receptors is = IgG
- Most autoimmune hemolytic anemias are mediated by autoantibodies that are = Warm IgG
- A patient is found to have bone pain and pallor. His blood picture shows numerous cells with an off-center nucleus. There's an increased number of immunoglobulins in serum that are monoclonal in origin. What's the likely percentage of immunoglobulins in this patient? = IgG 60%, IgA 20%, IgM 15%

- It also comes as
    - A patient has been diagnosed as a case of multiple myeloma. His most likely immunoglobulin pattern will be = IgA 0.5 g/L, IgM 0.2 g/L, IgG 23 g/L
- In multiple myeloma, there is overproduction of a single monoclonal immunoglobulin (most commonly IgG, followed by IgA
- Remember the sequence for such options (Mnemonic GAMe→ IgG>igA>igM)

KNOW THE DIFFERENCE

- A Rubella-positive expecting mother gave birth to a baby without symptoms. Which antibodies would the baby show on an ELISA test= IgG1
- To check for acute infection in a baby by ELISA, the antibody will be = IgM
    - For IgG1
        - During pregnancy, maternal IgG antibodies (including IgG1) cross the placenta and are transferred to the fetus.
        - These antibodies can persist in the baby's circulation for several months after birth, providing passive immunity.
        - Since the baby is asymptomatic, the detected IgG1 is likely maternal in origin, not indicative of the baby's own immune response.
    - For IgM
        - IgM antibodies are the first type of antibodies produced in response to an infection and do not cross the placenta.
        - Detection of IgM in a newborn indicates that the baby has mounted its own immune response, suggesting an active or recent infection.
        - This makes IgM the appropriate marker for diagnosing acute infection in a neonate.

OTHER

- IgE binds with= Mast cells
- A middle age female with recurrent chest infections, long history of diarrhea. On stool examination cysts of Giardia labia were detected. Peripheral smear reveals normal T cell but B cells are slightly decreased. Serum IgA 73, IgG 300 and IgM is 67. What is the most likely diagnosis=Common variable immunodeficiency
- 08 months old child having esophageal candidiasis, chest infection from pneumocystis carini, thin thymus, diminished body Lymph nodes and no germinal centers in Lymph nodes, causes is=Adenosine deaminase deficiency
- An 11-month-old infant had upper and lower respiratory tract infections almost continuously since birth with organisms including Pneumocystis jiroveci and Pseudomonas aeruginosa identified. The baby also has oropharyngeal candidiasis. The baby succumbs to a cytomegalovirus pneumonitis. At autopsy thymus is markedly hypoplastic, and lymph nodes throughout the body are small, with absent germinal centers on microscopic examination. Which of the following mechanisms is most likely to explain these findings=Adenosine deaminase deficiency

CHAPTER # 14

MICROBIOLOGY

411. PERSON PALE LOOKING HB LOW AND CONSTIPATION. ORGANISM CAUSING MICROCYTIC HYPOCHROMIC ANEMIA= ANCYLOSTOMA DUODENALE

KNOWN THE DIFFERENCE

- Diphylbothrum latum-------Megaloblastic anemia
- Ancylostoma duodenale---Microcytic anemia

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Fisher man only eating rice and fish. On labs anemia, MCV;106, some neuropathy signs, stool shows ova. Cause= Diphylbothrum latum
- A child with worm infestation Ancylostoma duodenale came with complains of pallor. Ix showed iron deficiency anemia. Most likely peripheral smear picture will show= Microcytic and hypochromic
- A pt developed Microcytic hypochromic anemia. On microscopy of Stools, Eggs were noticed. Which of the following is most likely responsible for this condition= Ancylostoma duodenale

412. THE MOST COMMON SITE FOR AMOEBIC ULCER IN THE GUT IS = CAECUM

ALSO REMEMBER THAT

	Hydatid liver disease	Pyogenic liver abscess	Amoebic liver abscess
Causative organism	❖ Echinococcus granulosus	❖ E. coli (most common) ❖ Streptococcus milleri ❖ Strep. Fecalis & Bacteroides	❖ Entamoeba histolytica
Pathophysiology	❖ it can affect any organ, but liver is the most common followed by lungs	❖ Ascending infection due to biliary obstruction (ascending cholangitis), or spread from empyema of gall bladder	❖ Trophozites entre portal circulation
Features	❖ Cysts in liver (75%), lung, bone and brain	❖ Multiple abscess	❖ Single abscess most common in right lobe ❖ Most commonly involves caecum (part of colon)
Diagnosis	❖ Indirect hemagglutination test most accurate test ❖ CT scan = investigation of choice	❖ US abdomen ❖ Alkaline phosphatase raised	❖ Serology ✓ Detectable antibodies in 95% of patient ❖
Treatment	❖ Albendazole 400mg 3 times daily for 30 days ❖ Surgical treatment= ERCP	❖ Ampicillin + Ciprofloxacin + Metronidazole ❖ If penicillin allergic= Ciprofloxacin + clindamycin	❖ Metronidazole/ tinidazole + Diloxanide furoate

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Amoebic abscess involves which portion of GIT most commonly= Caecum
- DOC for amoebic liver abscess=Tinidazole (metronidazole not in options)
- Amoebic liver abscess investigation= Serology
- Most common organism causing pyogenic liver abscess= E. coli
- In which of the following is man an intermediate host= Hydatid cyst
- A patient with right hypochondrium pain was admitted, after admission he develops lung abscess? (scenario of liver abscess later developing lung abscess) = Direct extension from liver abscess
- Regarding Pyogenic liver abscess, Predisposing factor= ascending cholangitis
- Which of the following infection is most likely related with Cysts in Brain with daughter cysts on a CT scan= Taenia Echinococcus
- Cause of Cysticercosis - Taenia solium (caused by ingesting eggs of Taenia solium)
- Causative organism for Cyst in liver - Teania echinococcus
- Bloody diarrhea, RUQ pain, liver abscess, flask shaped ulcer, causative organism= Entamoeba histolytica
- A female is infected by Trichomanas vaginalis appropriate treatment is=Metronidazole to both partners.

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413. MOST COMMON ORGANISM CAUSING PERITONITIS AFTER ABDOMINAL SURGERIES= BACTEROIDS

REMEMBER

- SBP/only peritonitis= E. coli
- Pyogenic peritonitis/ or any surgery or manipulation done= Bacteroids
- Puerperal sepsis= group A streptococci (Streptococcus) > E. Coli > Bacteroids

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414. A GROUP OF FRIENDS WHEN TO EAT FROM A CHINESE RESTAURANT WHERE THEY ORDERED FRIED RICE, CHICKEN AND VEGETABLE. AFTER 6 HOURS, PRESENTED WITH VOMIT, DIARRHEA AND ABDOMINAL CRAMPS. THE MOST LIKELY CAUSATIVE AGENT IS=BACILLUS CEREUS

NOTE THIS

- ✓ Diarrhea within 1-6 hours-------Staph aureus (vomiting predominant), Bacillus
- ✓ Diarrhea within 12-48 hours----Salmonella, E. coli (Abdominal cramps + nausea)
- ✓ Diarrhea within 48-72 hrs-------Shigella, Campylobacter
- ✓ Diarrhea > 7 days-----------------Giardiasis, Amoebiasis

REMEMBER HOW WOULD YOU DIFFERENTIATE BETWEEN STAPH AUREUS AND BACILLUS AS BOTH OCCURS IN SAME TIME PERIOD—AND BOTH ARE GIVEN IN OPTIONS—SO LOOK FOR

- Bacillus occurs with Reheated rice
- S. aureus occurs with Meats, mayonnaise, custard; preformed toxin

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415. CHILD HAD EATEN FROM RESTAURANT, THEN HAD BLOODY DIARRHEA, PETECHIAE AND FACIAL SWELLING. PERIPHERAL BLOOD PICTURE SHOWED SCHISTOCYTES. WHAT IS DIAGNOSIS= HUS

NOTE FOR FOOD POISONING SCENARIOS AND DIARRHEA

- ✓ Bloody diarrhea with schistocytes= HUS
- ✓ Diarrhea in HIV----- cryptosporidium
- ✓ Cholera toxin (Vibrio Cholera) --- Rice water diarrhea
- ✓ Heat stable & Heat labile enterotoxin (E. Coli) -----Watery, non-bloody diarrhea
- ✓ Shiga toxin / Vero-toxin / Shiga-like toxin (E. Coli) ----- Bloody diarrhea (Dysentery)
- ✓ Heat stable enterotoxin / Staphylococcal enterotoxin (Staph. Aureus) ---- Food poisoning

NOTE FEW PAST PAPERS MCQS ABOUT DIARRHEA

- Female Patient presented with complaint of weight loss, sweating, palpitation and diarrhea, on examination you find out BP is normal, what could be the probable diagnosis= Hyperthyroid

- ❖ A traveler came from Thailand with torrential diarrhea for several weeks. Stool R/E shows donut shaped cysts. What is the most likely cause= Cryptosporidium
- ❖ After feeding, a baby develops diarrhea/ what is the likely cause= Gastrocolic reflex
- ❖ A 40-year male working as a taxi driver in Dubai presented with complain of fever, weight loss, anorexia, and diarrhea. O/E he is emaciated, has jaundice, splenomegaly and generalized lymphadenopathy. What is the diagnosis= AIDS
- ❖ A baby brought by mother with complains of diarrhea and flatulence on/off after taking milk/ milk products. What is the likely diagnosis= Lactose intolerance
- ❖ A patient with prolonged diarrhea undergoes OGD. Biopsy of small intestine shows numerous crescent-shaped protozoa adjacent to epithelial brush border. Which is the likely pathogen involved= Giardia lamblia
- ❖ A child developed diarrhea. Biopsy of intestine show villous atrophy and gluten free diet doesn't improve his symptoms. What is the probable diagnosis= Giardiasis
- ❖ New born baby anemic for which she received exchanged transfusion. After 10 days he developed diarrhea and a rash on arm spreading to body. Diagnosis= Graft versus host reaction
- ❖ Man presents with diarrhea followed by vomiting, rapid dehydration, dry tongue BP of 90/40 Microscopic examination shows coma shaped organism. What is your diagnosis= Vibrio cholera
- ❖ Mother bring her child complaining of diarrhea and weight loss. Biopsy shows two nuclei organism which is pear shaped. Diagnosis= Giardiasis
- ❖ The most characteristic signs and symptoms of clostridium botulinum is= Flaccid paralysis of respiratory muscles
- ❖ Vibrio cholera causes diarrhea by which mechanism= Increase Cl channel opening
- ❖ Gram +ve, coco-bacillus with tumbling motility causes diarrhea in pregnant female = Listeria

ALSO REMEMBER THIS

- ❖ The most common carbohydrate malabsorption is due to deficiency of=Lactase

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416. IN PRIMARY SYPHILIS BEST SPECIMEN FOR DIAGNOSIS IS= GENITAL SORES

ABOUT SYPHILIS MCQS

- ❖ Hutchinson teeth is characteristic of=congenital syphilis
- ❖ 35 yr. Male usually goes to dubai and has h/o immoral sexual activities and doesn't use any protection. He has problem in walking in dark and loses balance, absent light reflexes, no pain sensation, most likely diagnosis=tabes dorsalis (caused by syphilis i.e. STD)
- ❖ A man who is sexually active was diagnosed with syphilis that he got from his sexual activity. Three weeks ago, serology was positive. What will be the most probable finding= penile chancre
- ❖ A 65-year man presented with constricted pupil, non-reactive to light but reacts with accommodation. The patient iris is depigmented in patches. He also gives history of suffering from syphilis. The condition that best describes his pupil is=Argyll Robertson pupil
- ❖ A lady delivered a baby having Hutchinson teeth which is centrally notched teeth found in which infection=Syphilis
- ❖ Gummatous necrosis occurs in=Syphilis

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417. BURKITT LYMPHOMA IN AIDS = EBV

VERY IMPORTANT ONCOGENIC MICROBES

Example	Importance/ disease
Herpes simplex virus-1	❖ Herpes labialis, Keratoconjunctivitis
Herpes simplex virus-2	❖ Herpes genitalis
Varicella-Zoster virus (HHV-3)	❖ Varicella-zoster (chickenpox, shingles)
Epstein-Barr virus (HHV-4)	❖ Infectious Mononucleosis ❖ Lymphoma in AIDS - EBV.

	❖ Burkitt lymphoma - EBV. ❖ Hodgkin lymphoma – EBV---esp. mixed cellularity ❖ Hairy tongue - EBV. ❖ Nasopharyngeal carcinoma - EBV.
Cytomegalovirus (HHV-5)	❖ Mononucleosis (⊖ Monospot) in immunocompetent patients ○ Infection in immunocompromised, especially pneumonia ○ In transplant patients, AIDS→ retinitis ○ Infected cells have characteristic "owl eye" inclusions
HHV- 6 and 7	❖ Roseola infantum
HHV-8	❖ Kaposi sarcoma (neoplasm of endothelial cells). Seen in HIV/AIDS and transplant patients
B19 virus	❖ Aplastic crises in sickle cell disease, ❖ "Slapped cheek" rash in children (erythema infectiosum, or fifth disease
HPV–	❖ **Warts** (caused by HPV 6-11) and **cervical cancer** (HPV 16 & 18) ❖ **Oropharyngeal carcinoma** ❖ Warts management: ○ Topical podophyllum or cryotherapy---first line ○ Topical imiquimod---second line
Measles virus	❖ Warthin-Finkeldey gaint cell (fused lymphocytes) ❖ Subacute sclerosing panencephalitis
Echovirus—	❖ Aseptic meningitis
Rhinovirus	❖ Common cold
Coxsackievirus	❖ Aseptic meningitis; herpangina ❖ Myocarditis; pericarditis
HTLV	❖ T-cell leukemia

NOW LET'S PRACTICE SOME PAPER MCQ'S

EBV

- Causative agent of infectious mononucleosis= EBV
- Burkitt lymphoma caused by= EBV
- EBV associated test= Positive Monospot test
- EBV associated Lymphoproliferative disease is= Burkitt lymphoma
- Cause of Nasopharyngeal CA= EBV
- The most likely neoplasm associated with Epstein-Barr virus is= Nasopharyngeal carcinoma
- Virus associated with Hodgkin lymphoma with mixed cellularity= EBV
- Tumor caused by EBV= Burkitt lymphoma
- EBV is diagnosed in which of the following disease= Burkitt lymphoma
- Which statement shows EBV has strong association with Burkitt lymphoma= Every patient with Burkitt's lymphoma have elevated antibody titre against viral capsid antigen
- An 8-year-old girl has facial pain and mass in mandible. Cause is= EBV
- Scenario with Atypical lymphocytosis= EBV
- Lymphoma in AIDs pt is caused by= EBV
- A pt suffering from AIDS. He is more likely to suffer from lymphoma. The most important virus responsible is= EBV
- B-lymphoma associated with which virus=EBV
- A 30-year male developed brain tumor. Histological examination revealed B-cell lymphoma. The most useful investigation in this pt is antibody test for= EBV

HPV

- One of the following is regarded as the most important carcinogen for the cervix=Human papilloma virus (HPV)
- A female with warty lesion on vulva. Diagnosis= Condyloma Accuminata
- Condyloma accuminata causative agent= HPV
- A 40 years old lady having mild dysplasia on PAP smear. Most likely etiology is= HPV
- What follows the sequence of metaplasia to dysplasia to carcinoma in situ and then CIN= HPV cervix
- Histological section of cervix uteri of a 40 year old woman reveals dyskaryotic changes. She belongs to middle class and has three children. The most likely cause of dyskaryosis in this patient is= Human Papilloma virus
- Squamous papilloma is caused by=Human papilloma virus (HPV)
- Warty lesion on vagina= HPV
- Cauliflower lesion caused by which organism= HPV
- Oropharyngeal carcinoma is caused by= HPV
- Bronchogenic Carcinoma is caused by which virus= HPV
- Cervical cancer caused by= HPV
    - It also comes as
        - Which of the following viruses is associated with human cervical cancer= HPV 16
        - Pap smear Ca cervix scenario, most common causative agent= HPV 16
        - A lady with Ca cervix suspicion. Which investigation is 96% specific and cost-effective= PAP smear

CMV

- Pt with AML undergo bone marrow transplant presented with pneumonia histology shows large cell with intranuclear inclusion, cause is= CMV
- A patient with AML undergoes bone marrow transplant, now presented with cold fever and mild cough. Histology shows giant cell with intracytoplasmic inclusion. What is most likely cause= CMV
- A patient with recent bone marrow transplantation is on immunosuppressive drugs. He is likely at risk to which of the following= CMV causing lymphoproliferative disorder
    - It also comes as with change option.
        - A patient with recent bone marrow transplantation is on immunosuppressive drugs. He is likely at risk to which of the following= CMV causing pneumonia and death

HERPES SIMPLEX

- Lady from a cold region going to Jeddah presented with Vesicles in oral mucosa. Vesicles were filled with clear fluid. Diagnosis= HSV 1
- A 20 year old male presented in OPD with painful vesicular lesions on the lower lip and ulceration of mouth for the last 3-4 days. The most likely organism responsible for this illness is= Herpes simplex virus type I
- Erythema multiforme (EM) is most commonly triggered by which virus= Herpes Simplex Virus (HSV)
- How is herpes simplex virus (HSV) primarily transmitted=Through direct skin-to-skin contact
- A 27-year-old nursing mother is diagnosed to have herpes simplex labialis. The drug most likely to be effective is=Acyclovir
- A 65-year-old patient presented with episodes of sharp shooting pain centered around the chin. He had been placed by his physician on tablet Tegretol 200 mg TDS, but of little relief. On examination he was found to have cutaneous eruptions in the distribution of the nerve. The primary cause of pain most likely is=Herpes zoster

OTHERS

- A young previously healthy female died within 3 days of presentation of chest pain and fever. On aspiration of pericardial fluid there were lymphocytes, what is the causative organism of the pathology= Coxsackie B virus
- Which cancer has virus carcinogen as cause= T cell Leukemia
- Which cause malignancyof stomach= H. pylori

- Complication of measles= subacute sclerosing encephalitis
- Which of the following is a late sequela of measles= Subacute sclerosing panencephalitis (SSPE)
- A 35-year-old man has noted several 1 to 2 cm reddish purple, nodular lesions present on the skin of his right arm which have increased in size and number over the past 3 months. The lesions do not itch and are not painful. He has had a watery diarrhea for the past month. On physical examination he has generalized lymphadenopathy and oral thrush. Which of the following infections is most likely to be related to the appearance of these skin lesions= Human herpesvirus 8

418. A PT PRESENTS WITH FEVER AND LYMPHADENOPATHY. INVESTIGATION SHOWS ATYPICAL LYMPHOCYTOSIS. NEXT INVESTIGATION TO REACH DIAGNOSIS IS=MONOSPOT TEST

REMEMBER

Epstein-Barr virus	❖ Infectious Mononucleosis (⊕ Monospot test→heterophile Antibodies) ✓ Heterophile antibody test also known as Monospot test and Paul-Burnell test ❖ Atypical lymphocytosis ○ Type of cell affected = B-cells ○ Atypical cells that proliferate in response= T-cells) ○ Hint----URTI + taken amoxicillin/ampicilin develops rash---diagnosis is of IM

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Following is caused by DNA virus= Infection mononucleosis
- A 30-year man gives history of a sore throat with fever followed by 6-weeks of malaise. O/E he has tender generalized lymphadenopathy. A cervical lymph biopsy is performed and microscopic examination reveals prominent germinal centers in follicles with a diffuse polyclonal hyperplasia composed of lymphocytes, plasma cells and macrophages. What is the most likely diagnosis=Infectious mononucleosis
- A 19-year-old presents with 5 days of fever (38°C/101°F) and sore throat. She also complains of fatigue for the past week and difficulty in swallowing. O/E she has generalized lymphadenopathy and biopsy shows atypical lymphocytosis. What is the likely cause= EBV
- The peripheral smear of infectious mononucleosis pt will show= Activated T cells
- Atypical lymphocytes in young boy. DNA virus causing it is= Infectious mononucleosis
- A 10-year boy presented with fever, sore throat and cervical lymphadenopathy. Peripheral film shows absolute atypical lymphocytes. What is the likely cause= Epstein bar virus
- A 20-years old girl presented with short history of sore throat and fever. O/E generalized cervical and axillary lymphadenopathy noted. Her peripheral blood film showed absolute lymphocytosis with more than 85% lymphocytes. The most likely diagnosis is= Infectious mononucleosis
    - It is also asked as
        - A sailor man presented with fever, rash on elbow, and generalized cervical lymphadenopathy with TLC of 7230. What is a suitable diagnosis= Infectious Mononucleosis
- A 20-year female presented with atypical lymphocytosis (20K). Diagnosis= Infectious Mononucleosis
- Diagnostic test for infectious mononucleosis=Paul-Bunnell test
    - It also come as
        - Diagnostic test for infectious mononucleosis= Heterophile antibody
        - A pt presents with fever and lymphadenopathy. Investigation shows atypical lymphocytosis. Next investigation to reach diagnosis is=Monospot test
        - The condition which will yield a high titer of serum heterophile antibodies is=Infectious Mononucleosis

419. PT KNOWN HIV IS SUFFERING FROM SEVERE HEADACHE, PHOTOPHOBIA AND SIGNS OF MENINGEAL IRRITATION, ON MICROSCOPY ORGANISM HAS HALO AROUND IT, THE ORGANISM IS=CRYPTOCOCCUS

<table>
<tr><td>Cause</td><td colspan="2">❖ HIV destroys CD4+ cells —weakens immune system
Start antiretroviral therapy in HIV when CD4 count is less than 350 × 10^6/L</td></tr>
<tr><td>AIDS</td><td>Diagnosis</td><td>❖ AIDS diagnosis ≤ 200 CD4+ cells/mm3 (normal: 500–1500 cells/mm3)</td></tr>
<tr><td></td><td>Diagnostic Tests</td><td>❖ Presumptive test→ ELISA and
❖ Confirmatory: Western blot assay
❖ For viral load→ PCR
❖ For Neonates: PCR</td></tr>
<tr><td>Common diseases of HIV-positive adults</td><td>
❖ CD4+ cell count < 500/mm3
<table>
<tr><td>Candida albicans</td><td>Oral thrush</td></tr>
<tr><td>EBV</td><td>Oral hairy leukoplakia</td></tr>
<tr><td>HHV-8</td><td>Kaposi sarcoma</td></tr>
<tr><td>HPV</td><td>Squamous cell carcinoma, cervical cancer</td></tr>
</table>
❖ CD4+ cell count < 200/mm3
○ Pneumocystis jirovecii
❖ CD4+ cell count < 100/mm3
<table>
<tr><td>Aspergillus fumigatus</td><td>Hemoptysis→ Cavitation/infiltrates on chest imaging</td></tr>
<tr><td>Candida albicans</td><td>Esophagitis</td></tr>
<tr><td>CMV</td><td>Retinitis</td></tr>
<tr><td>Cryptococcus Neoformans</td><td>Meningitis</td></tr>
<tr><td>Mycobacterium avium</td><td></td></tr>
<tr><td>Toxoplasma gondii</td><td>Brain abscesses</td></tr>
<tr><td>Cryptosporidium</td><td>most common causes of Diarrhea</td></tr>
</table>
</td><td>
❖ Pneumocystis jirovecii/carinii
○ Bilateral interstitial pulmonary infiltrates “Ground-glass-pulmonary infiltrates” opacities on CXR
○ Diagnosis= Broncho alveolar lavage (silver stain shows PJ)
○ Management:
• Co-trimoxazole (TMP-SMX
• IV pentamidine in severe cases
• Steroids if hypoxic
❖ Brain lesions in AIDS
○ Toxoplasmosis→Most common lesion, Multiple rings enhancing lesions in basal ganglia
○ Progressive multifocal leukoencephalopathy→ caused by JC virus, multiple bilateral non enhancing lesions in white matter
○ Primary CNS lymphoma→ No fever, single large homogenous enhancing periventricular lesion
❖ How to differentiate between toxoplasmosis and lymphoma
✓ Thallium SPECT test, --- +ive in Lymphoma and –ive in Toxoplasmosis
</td></tr>
</table>

NOW LET’S PRACTICE SOME PAPER **MCQ’S**

- ❖ Which of the following causes lymphoma in HIV/AIDS patient= EBV
- ❖ Most common biological carcinogen for the AIDS related lymphomas is=Epstein-barr virus
- ❖ In HIV patients, oral hairy Leukoplakia is caused by= EBV
- ❖ HIV positive patient with chest infection is prophylactically treated with= TMP-SMX
- ❖ Lymph node biopsy in early stages of HIV disease will reveal= Follicular hyperplasia
- ❖ HIV infected mother gave birth to a baby. Investigation to confirm infection in baby= PCR
- ❖ HIV virus kills which immune cells= CD 4 Th1 lymphocytes
- ❖ Which skin carcinoma is associated with AID/HIV= Kaposi sarcoma

- Most common organism causing infection in patients with HIV= Pneumocytic carini
- HIV positive but AIDS not proven, CD4 cell count is 800, got pyogenic SOM (serous otitis media) the causative organism= Pneumocystitis carinii
- Which is the longest phase of HIV without ANY symptoms= Latent phase (Ref: HIV AIDS Care and Counselling: A Multidisciplinary Approach by Alta C. Van Dyk)
- Transmission of AIDS= Mother to fetus
- AIDS defining cancer= Kaposi sarcoma
- Female having some sort of auto-immune disease and lymphoma from one year. Now her cervical lymph nodes are positive. What is the most probable reason= AIDS
- AIDS opportunistic= Pneumocystitis carini
- HIV associated nephropathy= Focal segmental glomerulosclerosis
- Longest incubation period among the following= HIV
- HIV pt. disease monitoring done by= CD4 cell count
- Which cell type decreases in HIV Pt commonly= CD4 -Th1
- A 35-year lady having cervical lymphadenopathy, is diagnosed as a case of malignant cell lymphoma. Which immunological disorder she is most likely to have= AIDS
- A known Hodgkin lymphoma pt presents with high grade fever and vomiting. O/E neck stiffness and Kernig sign was positive. CSF shows a fungal organism. Which organism is most likely responsible for it= Cryptococcus
- A 25-year-old male Aids patient has a fever of 102 F and complains of severe headaches during the past week. Staining of his CSF with India ink reveals Cryptococcus neoformans. The treatment should be= Amphotericin B
- A 30-year male developed brain tumor. Histological examination revealed B-cell lymphoma. The most useful investigation in this pt is antibody test for= EBV
- A pt HIV positive for 10 years presents with abdominal obstruction and pain, scan shows grey white mass which is resected and shows infiltrating and invading tumor most likely= B cell lymphoma
- A patient undergoes renal transplant, is on immunosuppressive therapy develops angular cheilitis. The causative agent likely is=Candida Albicans
- A 50-year female patient undergoing chemotherapy due to leukemia now presented with mouth ulcer and white colour membrane on oral mucosa. The causative organism is=Candida
- A tourist 2 weeks after returning from another country presents with fever, generalized lymphadenopathy and a macular rash. Atypical lymphocytosis seen on peripheral smear. Most probable diagnosis is= Acute HIV seroconversion
    - Man returns from trip abroad with maculopapular rash and flu like illness- think of HIV seroconversion always

---

420. BABY BORN TO HIV MOTHER. WHAT TEST WILL YOU PERFORM TO CONFIRM= PCR

KNOW THE DIFFERENCE

- Presumptive test→ ELISA and
- Confirmatory: Western blot assay
- For viral load→ PCR
- For Neonates: PCR

NOW LET'S PRACTICE SOME PAPER MCQ'S

- The HIV confirmatory test in baby of a HIV positive mother is= HIV PCR
- Investigation that confirms HIV in adults= Western blot

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421. MOST COMMON OPPORTUNISTIC INFECTION AFTER BONE TRANSPLANT IS= CMV

REMEMBER THESE MCQS

- The most common non-bacterial opportunistic organism recovered from burns is=Candida

- Opportunistic organism after splenectomy= Streptococcus Pneumonia
- Most common opportunistic infection after kidney transplant is= Polyoma
- Which opportunistic organism is commonly responsible for causing gastrointestinal ulcers in individuals with advanced HIV/AIDS= Cytomegalovirus (CMV)
- Chest infection after bone marrow transplant in patient of AML, with evidence of B/L cytoplasmic chest infiltrates. Organism involved is = CMV
- Most common opportunistic infection in patients with AIDS= Pneumocystis carinii
    - While Most common fungal opportunistic infection in HIV is= Candida

---

422. HIV PATIENT SURGERY DONE. WHAT AGENT COMMONLY USED TO WASH FLOORS AFTER SURGERY= 1% HYPOCHLORITE

REMEMBER:

- Post HIV patient----OT floor disinfectant---- Sodium hypochlorite (1%)
- HIV patient----instruments disinfectant----2% glutaraldehyde
- Face mask cleaning = Lukewarm water
- Face mask sterilization = ethylene oxide gas
- Syringes needles = gamma radiation
- instruments spores kill =dry heat oxidation
- Tindilization = heating in steam on 3 consecutive days for 20 mins

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Which of the following is used as an antiseptic for surgical scrub and skin during and after surgery=Chlorhexidine and Alcohol
- Which of the following is used as an antiseptic for hand wash in OT=Chlorhexidine and alcohol
- Most appropriate agent for skin disinfection is= Alcoholic solution of chlorhexidine
- An HIV +ve patient has undergone surgery. Before the next patient is to be scheduled in that operation theatre, the floors and walls should be washed with= 1% hypochlorite solution
- The most effective concentration of alcohol diluted in water for disinfection is= 70-80%
- Gamma radiation sterilization is used to sterilize which of the following instruments= Syringes and needles
- Most resistant to sterilization= Prions
- Cystoscope and endoscope sterilization is done which of the following= 2% Glutaraldehyde
- Ethylene Oxide sterilization time= <4hrs
- The following method is recommended for sterilization of facemasks from infection control point of view in anesthesia= Ethylene oxide sterilization
- Cleaning of face mask is by= Lukewarm water
- What step for prevention must be taken in ICU= Frequent hand cleaning.
- When equipment is sterilized= An autoclave routine of 3 minutes at 134°C & 221 KPA (32 lb/in) will be adequate for most equipment

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423. DIAGNOSTIC TEST FOR TYPHOID IN 2ND WEEK IS= BLOOD CULTURE AND WIDAL TEST

REMEMBER MNEMONIC= BASU

- 1st week = **B**lood Culture
- 2nd week = **A**ntibody/Widal
- 3rd week = **S**tool
- 4th week = **U**rine Culture

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Best Investigation in 1st week of typhoid= Blood culture
- Carrier typhoid=Asymptomatic
- Patient infected with typhoid and it has been a week. How to diagnose= Blood culture
- Few days after typhoid the bacteria resides in= Payer patches
- In 2nd week of Typhoid, bacilli reside in= Payer patches
    - After months then resides in gall bladder (chronic carrier)
- Neutropenia is associate with= Typhoid
- Test of choice for typhoid in 1st week is= Blood culture + typhoid antibodies (there was no option of blood culture alone)

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424. DEATH DUE CLOSTRIDIUM BOTULINUM = PARALYSIS OF RESPIRATORY MUSCLE

REPEATED QUESTIONS OF CLOSTRIDIUM

Clostridium tetani	❖ Spastic paralysis, risus sardonicus, and lockjaw (trismus). ❖ Toxin prevents release of inhibitory (GABA and glycine) neurotransmitters from Renshaw cells in spinal cord ❖ Spread via motor neurons ❖ Treatment ---- ✓ **Metronidazole now preferred to benzylpenicillin as the drug of choice**
Clostridium botulinum	❖ Flaccid paralysis, Floppy baby syndrome ❖ Toxin prevents release of stimulatory (ACh) signals at neuromuscular junctions resulting in flaccid paralysis
Clostridium perfringens	❖ Phospholipase→Degradation of phospholipids → myonecrosis ("gas gangrene") and hemolysis.
Clostridium difficile	❖ Pseudomembranous Colitis often 2° to antibiotic use ❖ Treatment: ✓ Metronidazole (10-14 days), if no response then oral Vancomycin ✓ **For life threating complications metronidazole + vancomycin**

NOW LET'S SOLVE SOME PAPER MCQ'S

- Pseudomembranous colitis by= Clostridium difficile
- Spore forming causes tetanus= Clostridium Tetani
- Gas gangrene= Clostridium perfringens if not in options then clostridium welchii
- Cause of death in by gas gangrene = Toxemia shock
- Characteristic feature of c. botulinum ingestion= Respiratory Failure
- Gas gangrene caused by= clostridium welchii (perfringens not in option)
- About Neuromuscular junction= Clostridium botulinum inhibits release of Ach
    - Remember
        - The receptors for acetylcholine and nicotinic are present in=Neuromuscular junction
- Pseudomembranous colitis caused by= Clostridium difficile
- Clostridium botulinum effect= Respiratory paralysis
- Death due Clostridium Botulinum = Paralysis of respiratory muscle
- characteristics finding of clostridium Botulinum is=flaccid paralysis of respiratory muscle
- Pseudo membranous colitis caused by which= clostridium difficile
- Most common cause of gas gangrene lower limb = clostridium welchii
- Pseudo membranous colitis treatment= metronidazole + Vancomycin

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425. 90% OF ANTHRAX PATIENT HAVE WHICH OF THE FOLLOWING FINDINGS= SKIN LESION

REMEMBER

Bacillus anthracis	Gram ⊕, spore-forming rod that produces anthrax toxin (an exotoxin consisting of protective antigen, lethal factor, and edema factor). **Cutaneous anthrax** ❖ ulcer with black eschar A (painless, necrotic) **Pulmonary anthrax** ❖ Inhalation of spores, most commonly from contaminated animals or animal products ❖ Flu-like symptoms that rapidly progress to fever, pulmonary hemorrhage, mediastinitis, and shock. Also known as woolsorter's disease.

NOW LET'S SOLVE SOME PAPER MCQ'S

- Pulmonary anthrax infection. Drug of choice is= ciprofloxacin
- Person with common cold along with mild chest pain and breathing problem. Diagnosed with early stage of pulmonary anthrax infection. Drug of choice is=Ciprofloxacin
- A farmer also looking after sheep presents with sore throat, fatigue and mild fever since 1 week. O/E he has a black lesion on his arm. What is the likely diagnosis= Anthrax
- Bacillus anthrax will grow on which culture medium= Blood agar

426. SCENARIO ON FISHERMAN WITH ANEMIA, WHICH PARASITIC INFECTION=DIPHYLLOBOTHRIUM LATUM

NOTE THE KEY WORDS REGARDING MICRO-ORGANISMS

- Fisherman with anemia and parasite= Diphyllobothrium latum
- Cholangio carcinoma =Clonorchis Sinensis
- Bladder cancer (squamous cell) --Schistosoma haematobium
- Diabetic patient + DKA died / Eye protrusion + skin redness = Mucormycosis
- River + Blindness, = Onchocercosis
- Global Blindness = Chlamydia
- Rectal prolapse= Trichuris
- Parasite + respiratory symptoms/lungs= Ascariasis

NOW LET'S SOLVE SOME PAPER MCQ'S

- Fisherman with macrocytic picture on smear and eggs in stool. Causative Organism is= Diphyllobothrium latum
- Organism associated with Bladder squamous cell carcinoma= Schistosoma haematobium
- Urinary bladder cancer caused by which species= Schistosoma hematobius
- Biliary tract parasitic infection= Clonorchis Sinensis
- Which parasite causes Cholangiocarcinoma= Clonorchis Sinensis
- Helminth disease caused by mosquito= Filariasis
- SCC of bladder by= Schistosoma haematobium
- A person eating raw and uncooked meat can cause infestation by=Tape worm
- Onchocerciasis causes which of the following= Eye involvement & skin nodules
  - This also comes as
    - A female after coming from foreign develops lesion/nodules on the side of her face and eye vision issue increasing gradually. Relate to which of the following=Onchocerca volvulus
    - A person living on river side develops blindness. Which organism is most likely to be the cause of blindness in this person= Onchocerca volvulus

- A female living at the riverside presents with a lesion on the side of her face and eye and complains of gradually increasing decrease in vision. Which of the following is likely responsible for it= Onchocerca volvulus

- An African woman comes to you with swollen eyes and skin rash. O/E a small filarial worm was noticed in the eye. The organism involved likely is= Loa Loa
- A Hypertensive and diabetic patient presented to ICU in comatose state. He had bleeding from nose and right eye orbital invasion and cellulitis. Organism most likely involved is= Mucormycosis
- Patient with diabetic ketoacidosis dies in hospital. He is found to have fungal infection in kidney, brain and heart. Most likely organism will be= Mucormycosis
- Which of the following fungi produce life threatening infection in patients with diabetic ketoacidosis- Mucormycosis
- In diabetics, ulceration of foot occurs due to= Neuropathy followed by Vasculopathy
- Parasite related to lung infection= Ascariasis
- A child with history habit of eating mud. He also complains of worms of 6 cm coming out from mouth- Ascaris Lumbricoides
- Parasite which is transmitted in human body, need human to complete their life cycle, non-parasitic to human= Ascaris
- Patient have respiratory issue; which parasite is present= Ascaris
- A young person presents with dyspepsia, pain epigastrium, constipation, and perversion of taste sensations. Her stool exam shows eggs. Diagnosis= Ascaris
- A child of presented with complain of per rectal bleeding on examination there is rectal prolapse, causative organism= Trichuris trichuri

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427. A PREGNANT WOMAN PRESENTED WITH GERMAN MEASLES AT 6TH WEEK OF PREGNANCY. WHICH OF THE FOLLOWING IS HER CHILD MOST LIKELY TO DEVELOP= CONGENITAL CATARACT

NOTE THE FEW IMPORTANT CONFUSING STEMS ABOUT RUBELLA AKA GERMAN MEASLES

- Most common congenital anomaly overall= Deafness
- A young woman is infected with rubella after 7th week of pregnancy, the offspring is likely to have= Congenital deafness
- Most common before week 7 = Cataract
  - Because the lens of the eye is in critical phase of development at that time
- Commonest Cardiac anomaly associated with Rubella – PDA

NOW LET'S SOLVE SOME PAPER MCQ'S

- A child is born with cataract. Which of the following would have affected his mother during pregnancy= Rubella
- How to prevent congenital Rubella= Anti-rubella vaccine in reproductive age
- Rubella infection to mother and u want to decide the abortion, what will support Ur decision= IgM
- An expected mother was infected with rubella. Months later she delivers a full-term baby with no obvious signs of infection. The best test to diagnose acute infection in neonate be a parasite specific ELISA for which isotype of immunoglobulin= Ig M
- Congenital anomaly of heart associated with rubella= PDA
- A pregnant woman got German measles. She consulted her obstetrician worrying about the baby. Which is the most likely complication the baby might develop= Deafness
- A woman with 5 weeks of pregnancy contracted German measles. She consulted her obstetrician worrying about the baby. Which is the most likely complication the baby might develop= Congenital cataract
- A young woman is infected with rubella after 7th week of pregnancy, the offspring is likely to have= Congenital deafness

428. A BABY WITH HUTCHISON TEETH, 8TH CRANIAL PALSY AND INTERSTITIAL KERATITIS. DIAGNOSIS= CONGENITAL SYPHILIS

ABOUT CONGENITAL INFECTIONS (TORCH INFECTIONS)

- ✓ The term **TORCH** includes **T**oxoplasmosis, **O**thers (such as syphilis, hepatitis B, etc.) **R**ubella, **C**ytomegalovirus and **H**erpes simplex virus
- ✓ Infection during the first trimester has the most devastating consequences.

Congenital Toxoplasmosis	❖ Toxoplasmosis is a parasitic disease caused by Toxoplasma gondii. ❖ Classic triad of triad of hydrocephalus, intracranial calcifications, and chorioretinitis.
Congenital syphilis	❖ maculopapular rash, osteochondritis, chorioretinitis, Hutchinson teeth, Clutton joints ❖ Syphilis is the only maternal infection that is associated with recurrent abortions
Congenital Rubella	❖ Congenital rubella is a condition that occurs in an infant whose mother is infected with the virus that causes German measles ❖ The classic findings of cataracts, deafness, and heart defects (PDA)
Congenital Cytomegalovirus	❖ Periventricular calcifications---characteristic finding ❖ Chorioretinitis, Microcephaly, Sensorineural hearing loss, Mental retardation
Herpes Simplex	❖ Three forms of disease have been described; ❖ Isolated mucocutaneous lesions (skin, eye, and/or mouth), including keratoconjunctivitis ❖ Encephalitis ❖ Disseminated disease involving multiple organs (lungs, liver, often CNS)

NOWLET'S SOLVE SOME PAPER MCQ'S

- ❖ Toxoplasmosis is= Parasitic infection
- ❖ Mother has infection of toxoplasmosis in 1st trimester, she was treated. Her baby is born now, to check infection in baby by ELIZA method which antibody will be there= IgM
- ❖ Patient having toxoplasmosis is suffering from which type of antibodies sufficiently= IgM
- ❖ Pregnant lady, having cat as a pet, most likely infection= Toxoplasmosis
- ❖ 2 days baby developed rash over her extremities, mother has untreated infection during pregnancy which organism is transmitted via vaginally= HSV
- ❖ A pregnant woman has a Siamese cat as a pet. Her baby is at risk to one of the following diseases=Toxoplasmosis
- ❖ A 22-year-old primigravida has noted no fetal movement at 18 weeks gestation. Fetal ultrasound examination shows marked hydrops fetalis and organomegaly. There is extensive cerebral necrosis and periventricular calcification. Infection with which of the following organisms is most likely to produce these findings= Cytomegalovirus CMV

429. 4-YEAR BOY SPLENECTOMY DONE DUE TO ITP. MOST LIKELY ORGANISM THAT CAUSE INFECTION = HEMOPHILUS INFLUENZA

- ✓ Remember = Streptococcus pneumoniae > Haemophilus Influenzae > Neisseria meningitidis)

NOW LET'S SOLVE SOME PAPER MCQ'S

- ❖ Post splenectomy elderly male... cause of infection= strep pneumonia
- ❖ Opportunistic organism after splenectomy= Streptococcus Pneumonia

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- ❖ Patient having toxoplasmosis is suffering from which type of antibodies sufficiently= IgM
- ❖ Pregnant lady, having cat as a pet, most likely infection= Toxoplasmosis
- ❖ 2 days baby developed rash over her extremities, mother has untreated infection during pregnancy which organism is transmitted via vaginally= HSV
- ❖ A pregnant woman has a Siamese cat as a pet. Her baby is at risk to one of the following diseases=Toxoplasmosis
- ❖ A 22-year-old primigravida has noted no fetal movement at 18 weeks gestation. Fetal ultrasound examination shows marked hydrops fetalis and organomegaly. There is extensive cerebral necrosis and periventricular calcification. Infection with which of the following organisms is most likely to produce these findings= Cytomegalovirus CMV

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- ✓ Remember = Streptococcus pneumoniae > Haemophilus Influenzae > Neisseria meningitidis)

NOW LET'S SOLVE SOME PAPER MCQ'S

- ❖ Post splenectomy elderly male... cause of infection= strep pneumonia
- ❖ Opportunistic organism after splenectomy= Streptococcus Pneumonia

- After splenectomy vaccination against which organism should be done= Streptococcus pneumoniae

430. CORYNEBACTERIUM DIPHTHERIA PRODUCES = EXOTOXINS

NOTE THESE

Bacteria	**Toxin**	**Manifestation**
Corynebacterium diphtheriae	Diphtheria toxin (exotoxin)	❖ Pharyngitis with pseudomembrane in throat and severe lymphadenopathy (bull neck)
Pseudomonas aeruginosa	Exotoxin-A	
Staphylococcus aureus	Toxic shock syndrome toxin (TSST-1)	❖ Toxic shock syndrome: ❖ Scalded skin syndrome (**exfoliative toxin**) ❖ Food poisoning (**heat-stable enterotoxin**)
Streptococcus pyogenes	Streptolysin-O	❖ Contributes to β-hemolysis. ❖ Host antibodies against toxin (ASO) used to diagnose rheumatic fever
	Exotoxin A	❖ Toxic shock-like syndrome: (a toxic shock like syndrome associated with painful skin infection). ❖ Scarlet fever (**erythrogenic toxin**)
Vibrio cholerae	Cholera toxin	❖ ↑ Cl− secretion in gut, Voluminous "rice-water" diarrhea
Clostridium tetani	Tetanospasmin (Exotoxin)	❖ Spastic paralysis, risus sardonicus, and "lockjaw". ❖ Toxin prevents release of inhibitory (GABA and glycine) neurotransmitters from Renshaw cells in spinal cord ❖ Spread via motor neurons
Clostridium botulinum	Botulinum toxin	❖ **Flaccid paralysis,** ❖ Floppy baby syndrome ❖ Toxin prevents release of stimulatory (ACh) signals at neuromuscular junctions resulting in flaccid paralysis
Clostridium perfringens	Alpha toxin	❖ Phospholipase→Degradation of phospholipids→ myonecrosis ("gas gangrene") and hemolysis.

NOW LET'S PRACTICE SOME PAPER MCQ's

- Boy developed fever hypotension and erythematous rash on face and limbs within 24 hours. Cause= Erythrogenic toxin
- Patient complained of Abdominal Pain and persistent vomiting. Cause= Enterotoxin
- Pseudomonas scenario in the end toxin asked= Exotoxin-A
- Child dyspnea, pseudo membrane cause is= Exotoxin of diphtheria
- Regarding Corynebacterium Diphtheria, following is true= It acts by exotoxins
- Endotoxin= Release after bacteria death
- Which toxin responsible for scarlet fever= Erythrogenic
- Most important action of endotoxin= Activation of complement system
- Diphtheria has following most likely feature= Exotoxin mediated damage
- Endotoxin mediates its action by= Activating complement system
- Diphtheria exotoxin has major effect on= Heart
- Thorn prick...abscess formation. Most likely organism=Staph aureus
- True regarding vibrio cholera=Transmitted by water and uncooked food
- Most prominent toxin produced by streptococcus pneumonia is= Streptolysin O (correct option is pneumolysin but not PRESENT in paper)

- Gram negative organism causes shock by=- endotoxin
- A neutropenic hypotensive patient is admitted in oncology ward with history of dysuria and high grade fever. His blood culture yielded growth of Pseudomonas aeruginosa. The cause of symptoms in this patient is due to release of= Endotoxin
    - Pseudomonas aeruginosa usually toxin is= exotoxin
    - But when symptoms such as high grade fever mentioned its= Endotoxin

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431. SHORTEST PRE –ERYTHROCYTIC PHASE OF WHICH PLASMODIUM= FALCIPARUM

KNOW THIS.

- Shortest Pre –Erythrocytic Phase of Which Plasmodium= Falciparum
- Longest Pro-Erythrocyte Stage= P. Malariae

---

432. WHICH PLASMODIUM SPECIES HAS THE LONGEST INCUBATION PERIOD= MALARIAE

- Five species
    - Plasmodium Falciparum
        - Malignant malaria, Severe; irregular fever patterns; Cerebral malaria, Hemoglobinuria, black water fever
    - Plasmodium Vivax
        - Most common in Asia (Pakistan)
        - 48-hr cycle (tertian fever- fever on every 3rd day)
    - Plasmodium Malariae
        - Quartan fever (72-hour cycle)
        - P. malariae is associated with nephrotic syndrome
        - ARDS
    - P. ovale
    - Plasmodium knowlesi

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Cerebral Malaria Caused By= Plasmodium Falciparum
- The clinical feature of Plasmodium falciparum infection is= Black water fever
- Black Water Fever By (or black color urine) = Plasmodium Falciparum
- Quadrant malarial fever is caused by= P. Malariae
- Plasmodium Falciparum= Malignant malaria
- The most recognized etiology of cerebral malaria is=P. falciparum
- A 40-years old male visiting Pakistan for the first time developed fever of 2 days duration followed by headache confusion and coma. His renal function were deranged. His blood complete picture revealed Hb 7.4g/dl Total WBC 7x109/l, Platelets 95x109/l with reticulocyte count of 10%. The most likely diagnosis is= Falciparum malaria
- A 44 years old English businessman, who has recently returned home from Thailand, suddenly develops periodic high grade fever with severe body aches, chills and orthostatic hypotension. What is the most likely preliminary diagnosis=Malaria
- A child with complains of fever with rigors and chills, severe headache, hepatosplenomegaly and history of nausea, vomiting one week back. Labs show Giemsa stain positive. Diagnosis=Plasmodium
- Malaria Is Associated With= Hemolytic Anemia
- A child from a mosquito infested area of a forest presented with repeated attacks of sudden high grade fever with rigors lasting for 8 weeks. He was started on chloroquine but the symptoms still persist. Banana shaped gametocyte were seen in the peripheral blood smear. O/E splenomegaly was present. Which of the following parasite is the most likely etiological agent=Plasmodium falciparum
    - Plasmodium falciparum is named for the crescent, banana or falciform shape

KNOW THE DIFFERENCE

- A 4-year boy is brought in by his mother after she discovers that his urine is now a dark Coca-Cola color. She reports that he saw doctor 10 days ago for a sore throat, but he has otherwise been well. The organism responsible for his condition is=Group A Streptococci
- A 30-year female in village presents with fever, weakness, rigor and chills with weakness. She has been passing cola colored urine since 2 days (NO drug history mentioned). A mobile health team visited her to carry out some investigation and diagnosed her as=Falciparum Malaria
- A 06-year-old boy presents with 4 days history of high-grade fever and jaundice. He also gives history of passage of cola colored urine for the past 01 day. He was given antimalarials. His Hb is 5.6 g/dl, platelet count 185x109/L, TLC 10 x109/L and reticulocyte count 20%. The most likely diagnosis in this case is=G6PD deficiency
- A pt took primaquine for malaria and developed anemia. Peripheral film showed Heinz bodies and bite cells. Diagnosis=G6PD deficiency

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433. MECHANISM OF PYRIMETHAMINE IN MALARIAL PARASITE=INHIBITS DIHYDROFOLATE REDUCTASE

TREATMENT

- P. Vivax/ovale or malariae
    - Chloroquine
    - In cases of P vivax, P ovale, or an unknown species, primaquine is added to eradicate the hypnozoites in the liver.
- P. falciparum uncomplicated
    - artemisin based combinations
- Sever falciparum malariae
    - IV artesunate
    - If parasite count >10%--exchange transfusion
    - Shock may indicate co-existing bacterial infection—malaria rarely causes hemodynamic collapse
- Prophylaxis
    - Chloroquine (1 week before and 4 weeks after travel)
    - If Chloroquine resistant area (1 week before and 4 weeks after travel)
        - Malarone (atovaquone + proguanil),
        - Mefloquine
        - Doxycycline
    - If children
        - Diethyltolumide
        - Doxycycline (if age >12 years)
- Antimalaria contraindications:
    - Primaquine: must be tested for G6PD first.
    - Mefloquine: seizure, psychiatric, and cardiac conduction disorders.
    - Atovaquone/proguanil: pregnant/breastfeeding, renal disease.
    - Chloroquine: psoriasis.

NOW LET'S PRACTICE SOME PAPER MCQ'S

- A patient with recurrent malaria despite using mosquito nets and repellents, what would you recommend for prevention of relapse in malaria=Primaquine
- The best drug for chloroquine resistant plasmodium falciparum malaria is=Mefloquine

ALSO REMEMBER THESE

- Malarial parasite is transferred into human blood in form of= sporozoites
- Plasmodium enters the mosquito in which form= Gametocyte

- Malaria in Which Stage Inactive in Body= Hypnozoite
  - It also comes as
    - Dormant state of malaria parasite is=Hypnozoites
- Plasmodium falciparum belong to which of the following= Sporozoan
- One of the following malarial parasites do NOT complete erythrocytic phase of Schizogony in 48 hours=Plasmodium malariae

434. FARMER WITH MIGRATORY LESION ON FOOT = CUTANEOUS LARVA MIGRANS

- Note the key word MIGRAtory lesion= Larva MIGRAns

435. MOST COMMON POST BURNS NONBACTERIAL ORGANISM= CANDIDA

ALSO NOTE THAT

- In burns, which protein becomes deficient= Albumin
- Metabolic derangements common to patients with burns= Hyponatremia
- Increased ESR is due to=Decrease albumin

436. WHICH ORGANISM CAUSES LYMPHOGRANULOMA VENERUM= CHLAMYDIA TRACHOMATIS L1–L3

NOTE THAT

	Chlamydia	Gonorrhea
Caused by	❖ Chlamydia trachomatis, STD	❖ Neisseria gonorrhea, STD
Serotypes	❖ Serotypes A, B and C= Trachoma (follicular conjunctivitis with corneal scarring) ❖ Serotypes L1- L3= Lymphogranuloma venerum ❖ Serotypes D-K – STD	

437. VISITED THAILAND, DIARRHEA DOUGHNUT SHAPED CYST= CRYPTOSPORIDIUM

SOME PAST PAPER MCQ'S ABOUT DIARRHEA

- An 11 years old boy presented with diarrhea. Small intestine biopsy revealed villous atrophy. There were no improvements in symptoms on a gluten free diet. Diagnosis= Giardiasis
- Obese patient taking oral hypoglycemic developed diarrhea and metallic taste in mouth= Metformin
- Scenario of recurrent respiratory infection and chronic diarrhea= Cystic fibrosis
- Patient with cystic fibrosis, they were asking what pt will develop= Bronchiectasis
- Pt after surgery took antibiotics for 2 months, now complains of Diarrhea. What is seen on endoscopy= Pseudo-membrane with white patches
- Travelers' diarrhea DOC= Norfloxacin > Diphenoxylate
- Dementia, diarrhea, dermatitis caused due to deficiency of= Niacin

KNOW THE DIFFERENCE

- Which of the following cause death due to diarrhea= Vibrio cholera
- Organism responsible for sudden death due to food poisoning= Clostridium Botulinum

438. A WOMAN PRESENTED WITH VULVAR ITCHING AND PINK FROTHY, PURULENT VAGINAL DISCHARGE. WHAT IS THE LIKELY CAUSE= TRICHOMONAS VAGINALIS

REGARDING VAGINAL DISCHARGES

Bacterial vaginosis	❖ Caused by Gardnerella vaginalis ❖ Vaginal discharge: "fishy", offensive ❖ Results in low birth weight, preterm labor, late miscarriage

	❖ Treatment: ○ Oral metronidazole for 5-7 days (alternative topical metronidazole or clindamycin)
Trichomonas vaginalis	❖ Yellow/green, frothy discharge, strawberry cervix, itchy and burning ❖ Metronidazole for patient and partner (prophylaxis)
Candida	❖ Cottage cheese discharge, vulvitis, itchy

NOW LET'S PRACTICE SOME PAPER MCQ'S

- A female with fishy smell vaginal discharge, clue cells seen on microscopy. What is the best drug of choice Metronidazole.
- A female is infected by Trichomonas vaginalis appropriate treatment is= Metronidazole to both partners
- A female present with greenish foul-smelling vaginal discharge. On microscopy motile trophozoites are seen. Which organism is responsible= Trichomonas vaginalis
- DOC for Trichomonas vaginalis is=Metronidazole
- A woman presented with vulvar itching and yellow/green frothy, purulent vaginal discharge. What is the likely cause=Trichomonas vaginalis
- The most common organism causing preterm labor is=Bacterial vaginosis
- A 38-year-old healthy woman has had a white, curd-like vaginal discharge for the past week. There is no bleeding. A Pap smear demonstrates normal appearing squamous epithelial cells along with scattered neutrophils and budding cells with pseudohyphae. Which of the following infectious agents is most likely to be present in this woman=Candida albicans

439. MOST COMMON ORGANISM FOUND IN BOIL OF NOSE= STAPHYLOCOCCUS AUREUS

REMEMBER THESE MCQS OF MOST COMMON ORGANISMS

- Most common organism for bacterial conjunctivitis= Staph aureus
    - Adults-----Staphylococcus aureus is the most common cause.
    - Children----- Haemophilus influenzae and Streptococcus pneumonia are more common.
- Most common organism in ascitic tap= E. coli
- The most common organism causing knee infection in a young person= Staph aureus
- Most common organism causing UTI= E. coli
- Most common organism causing pyogenic peritonitis after abdominal surgeries= Bacteroid
- Most common organism causing preterm labor= Bacterial vaginosis
- Most common organism in pyogenic osteomyelitis= Staphylococcus aureus
- Most common organism causing pyogenic liver abscess= E. coli
- Most common organism causing opportunistic infection in patients with HIV= Pneumocystis jirovecii
- Most common organism spread by blood transfusion and its products= Hepatitis B virus

CHAPTER # 15

HISTOLOGY

440. TYPE OF COLLAGEN IN DERMIS OF SKIN= TYPE 1

REMEMBER ESPECIALLY THE BOLD LETTERS

Type	Examples	Notes
Type-I	Bone, **Skin**, Tendon, fascia, **late wound healing**	❖ Most abundant form (90%) ❖ Defective synthesis in **osteogenesis imperfecta**
Type- II	**Cartilage (including hyaline)**, vitreous body and nucleus pulposus.	
Type- III	**Reticular fibers**. **granulation tissue**, embryonic tissue, uterus, blood vessels, **early wound healing**	❖ Type III: deficient in the vascular type of **Ehlers-Danlos syndrome**
Type- IV	**Basement membrane**, basal lamina, lens	❖ Defective in **Alport syndrome** ❖ Targeted by autoantibodies in **Goodpasture syndrome**

Note How to remember it:

The higher number you go the weaker it goes

- Type I is the strongest as it is located in bones, skin, tendons, fascia
- Type II little bit less strength seen in cartilage, vitreous humour, and nucleus pulposus
- Type III goes even weaker as it is present in granulation tissue, embryonic tissue, uterus, blood vessels
- Type IV is the weakest is it only supports a row of epithelial cells as it's found only in basement membranes

Another mnemonic:

Type ONE= BONE, type TWO= carTWOlage, type FOUR= FLOOR (**BASEMENT** membrane)

NOW LET'S PRACTICE SOME PAPER MCQ'S

GENERAL FEATURES

- Collagen fibers in the body? = Are found in all types of connective tissue
- Correct regarding collagen fibers is = Present in all types of connective tissue
- The most likely feature of collagen fibers is = Stain lightly with eosin
- Vertical striations are present in = Reticular fibers
- Lamellar striations are present in = Collagen fibers
- Lamellar appearance under light microscopy = Collagen fibers

COLLAGEN TYPES AND LOCATIONS

- Collagen type in healthy skin = Type 1 and 3
- The most likely collagen fibers found in the dermis of the skin = Collagen type I
- Most abundant collagen in dermis = Type 1
- Type 1 collagen is seen in = Skin
- Type of collagen for wound strength = Type 1
- Type of collagen in periodontal ligament = Type 1
- Collagen fibers regularly arranged in = Reticular layer
- The distinctive arrangement of collagen fibers in the skin is predominantly found in = Reticular layer

MISCELLANEOUS

- A young boy presents with radical and multiple other bone fractures and blue sclera. This disease occurs due to a defect in = Collagen
- Osteogenesis Imperfecta is due to = Defect in collagen synthesis
- The pathogenic mechanism involved in osteogenesis imperfecta is = Hereditary defect in synthesis of collagen
- Collagen atrophy involves one of the following = Increased extractable soluble collagen in old age
- Which one of the following is associated with collagen atrophy = Steroid use
- Collagen atrophy due to = Collagenase
- The most likely feature of collagen atrophy is = Bleeding following injury
- Which intracellular substance helps in wound healing? = Collagen
- A 23-year-old woman receiving corticosteroids for an autoimmune disease has an abscess on her upper outer right arm. Which one of the following aspects of wound healing is most likely to be deficient in this patient? = Collagen deposition
- Collagen and amorphous substance formation in granulation tissue is a function of = Fibroblasts
- Vitamin C is required for which step in collagen synthesis? = Hydroxylation of proline and lysine residues
- One of the following is involved in the formation of hydroxyproline during collagen synthesis = Ascorbic acid
- IV prostaglandin initiates ripening of the cervix by = Hydration of collagen
- Intravaginal administration of prostaglandin initiates cervical ripening by = Hydration of collagen tissue

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441. DURING WOUND HEALING STRENGTH IS PROVIDED BY= TYPE-1 COLLAGEN

NOTE THAT

- Type 3 in present in early wound healing, while type 1 in late wound healing
- Type 3 is replaced by type 1 in remodeling phase which increases tensile strength (Ref: first aid: page 211)
- Complication of wound healing in all people= contracture
- Complication of wound healing in black people= keloid

NOW LET'S PRACTICE SOME PAPER MCQ'S

- The most important feature of open wound healing is= Contraction of myofibroblasts
- In wound healing, the maximum tensile strength is achieved in= Three months
- The most likely type of collagen providing strength during wound healing is= Collagen type I
- A 20-year-old woman sustains an injury to her right calf in a mountain biking accident near Moab. On physical examination she has a 5 cm long laceration on the right lateral aspect of her lower leg. This wound is closed with sutures. Wound healing proceeds over the next week. Which of the following factors will be most likely to aid and not inhibit wound healing in this patient= Presence of sutures
- During wound healing and collagen synthesis, the process which is promoted by Ascorbic acid is= Hydroxylation of pro-collagen
- The major function of granulation tissue in a wound healing by second intention is to= Contract the wound
- Inc collagen synthesis which vitamin is required= Vit. C
- Vitamin C is required for which step in collagen synthesis=Hydroxylation of proline and lysine residues
- A female pt underwent C-Section 3 months back. Her wound is not healing properly. She is taking diet rich in proteins and carbohydrates but deficient in fruits and vegetables. Reason for poor wound healing is= Decrease Collagen tensile strength
    - Reason→ ((Vitamin C Deficiency→ Decrease Hydroxylation of Collagen→ Decrease Tensile Strength)

KNOW THE DIFFERENCE

- A 35 yrs. black athlete presented with 3rd degree burn. He is most likely to develop= Keloid
    - Wound healing beyond original wound margins is=Keloid

- ❖ A 30-year-old fire fighter suffers extensive third degree burns over his arms and hands. This patient is at high risk for developing which of the following complications of wound healing= Contracture

KNOW THE DIFFERENCE

- ❖ Local factor causing delayed wound healing= Infection
- ❖ Systemic factor causing delayed wound healing= DM
- ❖ The single most important cause of delay in wound healing is= Infection
- ❖ Difference between primary & secondary intention wound healing is= Wound contraction
- ❖ A 23-year-old woman receiving corticosteroids for an autoimmune disease has an abscess on her upper outer right arm. She undergoes minor surgery, to incise and drain the abscess, but the wound heals poorly over the next month. Which one of the following aspects of wound healing is most likely to be deficient in this patient= Collagen deposition
- ❖ An old man suffering from a wound notice delayed healing. What will be the most common cause of poor wound healing in him= Decrease blood supply

KNOW THE DIFFERENCE

- ❖ Which of the following will prevent wound contraction= Corticosteroids
- ❖ Which of the following helps in wound contraction= Myofibroblasts
- ❖ What helps in wound healing=Microfilaments

442. ENZYME IN TISSUE REMODELING= METALLOPROTEINASE

REMEMBER

- ❖ TGF-β (Transforming Growth Factor Beta): Stimulates the production of collagen and inhibits its degradation.
- ❖ TGF-β and PDGF (Platelet-Derived Growth Factor): Important growth factors for tissue healing, scar formation, and fibrosis.
- ❖ VEGF (Vascular Endothelial Growth Factor) and FGF (Fibroblast Growth Factor): Essential growth factors for the formation of new blood vessels (angiogenesis).
- ❖ Metalloproteinase (zinc-dependent) and Lysyl Oxidase (copper-dependent): Key enzymes responsible for tissue remodeling and strengthening.

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- ❖ Angiogenesis in wound healing is by= Metalloproteinases
- ❖ Tissue remodeling is by=Metalloproteinase
- ❖ Which of the following is a cranial suture fusion factor= Fibroblast growth factor (FGF)
- ❖ Resected tumor from abdomen biopsy showed new vessels (Angiogenesis) which factor= VEGF
- ❖ New vessel proliferation is done by which of these substance from macrophages= FGF
- ❖ Pt wound sutured. After a week new vessel formed. Which of these substance is responsible= FGF
- ❖ What do bacteria secrete to aid in the proliferation of new capillaries in a wound= Fibroblast Growth Factor (FGF)

443. ARTICULAR SURFACE HAS WHICH CARTILAGE= HYALINE

REMEMBER THIS

Hyaline cartilage	Fibro-cartilage	Elastic cartilage
Called hyaline (glass like), because fibers are not visible	Fibers are visible	Fibers are visible
Composed of collagen type II	Composed of collagen type I	Collagen type II
Examples (ENT CAAR)	Examples ❖ Intervertebral discs ❖ Glenoid labrum	Examples Elastic cartilage→3 E ❖ Ear pinna

❖ Epiphyseal cartilage of growing long bones ❖ Nasal cartilage ❖ Thyroid cartilage ❖ Cricoid cartilage ❖ Articular cartilage ❖ Arytenoid cartilage ❖ Ribs (costal cartilage)	❖ Acetabular labrum ❖ Menisci of knee	❖ External auditory tube ❖ Epiglottis

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ Regarding hyaline cartilage= Collagen fibers not visible---- (Collagen fibers are present but not visible)
- ❖ About fibrocartilage= It is present inside disc of joints
- ❖ Fibrocartilage= Intervertebral disc
- ❖ Fibrocartilage abundant in= Collagen
- ❖ Alcoholic patient came with bleeding at base of hair in scalp. O/E non-healing marks on body were present. Which cell is defective=Fibroblasts
- ❖ Hyaline cartilage is present in= Larynx
- ❖ Sesamoid cartilage found in= Larynx (ala of nose> larynx)
- ❖ Which of the following is true= Epiglottis have elastic cartilage
- ❖ Fibrocartilage contain which fibers= Collagen
- ❖ Regarding Carina= Ant-Post Cartilage at the Bifurcation of Trachea
- ❖ The ground substance of Fibrocartilage has abundant of= Collagen fibers
- ❖ Regarding collagen fibres=Lightly stain with eosin
- ❖ Costal cartilage is= Hyaline
- ❖ Lamina propria of vagina has=Elastic fibers
- ❖ Regarding synovial joints, which is correct= Always Covered by hyaline membrane
- ❖ Syndesmosis is an example of=Fibrous joint

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444. STRATIFIED COLUMNAR EPITHELIUM FOUND IN= SALIVARY GLANDS

ABOUT EPITHELIUM

Simple epithelium	Stratified epithelium
Consist of single layer of cells	Consist of two or more layers
Further subtypes: ❖ Simple squamous (flat cells) ➧ Examples: heart, blood vessels, alveoli	Further subtypes: ❖ Stratified squamous ○ Keratinized→contains keratin ➧ Example: skin, parts of oral cavity ○ Non-keratinized →no keratin ➧ Example: esophagus, oropharynx, lower part of anal canal, vagina
❖ Simple cuboidal (cube-like cells) ➧ Examples: DCT of nephron, ovary	❖ Stratified cuboidal ➧ Example: sweat gland ducts
❖ Simple columnar (column like cells) ➧ Examples: ➧ Non-Ciliated: stomach, gall bladder and intestine ➧ Ciliated: uterine tubes, uterus	❖ Stratified columnar ➧ Example: salivary glands ducts, male urethra
❖ Pseudostratified (single layer of cells but gives a false impression of stratification) ➧ Examples: nasal cavity, nasopharynx, conducting part of respiratory tract.	❖ Transitional epithelium ➧ Example: renal pelvis, ureter, urinary bladder, part of urethra.

NOW LET'S PRACTICE SOME PAPER MCQ'S

SIMPLE CUBOIDAL EPITHELIUM

- Surface epithelium of the ovary = Simple cuboidal
- Thyroid follicles are lined by = Simple cuboidal epithelium
- Epithelium of terminal bronchioles is made up of = Simple cuboidal without goblet cells

STRATIFIED CUBOIDAL EPITHELIUM

- True statement regarding sweat gland = Stratified cuboidal epithelium
- Stratified cuboidal epithelium is present in = Sweat gland duct

STRATIFIED SQUAMOUS EPITHELIUM

- The lining epithelium of the vagina is = Non-keratinized stratified squamous epithelium
- A stratified squamous keratinized epithelium of the tongue is termed = Filiform papillae
- Epithelium of vestibular part of the nose = Stratified squamous epithelium
- The presence of stratified squamous epithelium in the endocervix is termed as = Metaplasia
- A tubular structure containing stratified squamous epithelium was identified as the vagina. What will be seen on microscopy/histology that differentiates it from other structures? = Lamina propria with elastic fibers
- Following has lymphoid tissue with surrounding stratified squamous epithelium = Palatine tonsil
- Epithelium found upon surface to friction which it serves to protect against mechanical injury = Stratified squamous keratinized
- Skin which is most prone to abrasions, damage, and environment is usually covered with = Stratified squamous keratinized
- About hymen = Covered by stratified squamous epithelium
- Stratified squamous epithelium is on = Uvula
- Uvula is lined by which epithelium = Stratified squamous epithelium
- Vocal cords are lined by = Stratified squamous epithelium
- Lining epithelium of vagina is = Non-keratinized stratified squamous epithelium
- Stratified squamous epithelium is present in = Esophagus
- Stratified squamous epithelium is present in = Subglottis
- Superficial layer of corneal epithelium is made up of = Stratified squamous non-keratinized

COLUMNAR EPITHELIUM

- Histology of gall bladder = Columnar epithelium
- Regarding columnar epithelium = Male urethra has pseudostratified columnar epithelium
- Columnar epithelium is present in = Uterine tube
- Regarding cilia = Are present on the luminal surface of simple columnar epithelium
- Type of epithelium in intestine = Simple columnar
- A histological section of a gland shows many acini lined with pseudostratified columnar epithelium, embedded in stroma with smooth muscle in it. Which gland is it = Prostate gland
- Cells of simple columnar epithelium are connected by = Tight junctions only
- Columnar epithelium lines = Uterine tubes

PSEUDOSTRATIFIED COLUMNAR EPITHELIUM

- Pseudostratified ciliated columnar epithelium is found in = Trachea
- Trachea epithelium = Pseudostratified columnar ciliated
- Lining epithelium of the eustachian tube = Ciliated pseudostratified columnar epithelium
- A gland with glandular acini lined by pseudostratified columnar epithelium and lamellated glycoprotein masses is most likely the = Prostate
- A student observing a histology slide of a tubular structure with a thick vascular wall and pseudostratified epithelium. The most likely structure is = Vas deferens

TRANSITIONAL EPITHELIUM

- The ureter is lined by = Stratified transitional epithelium
- Transitional epithelium is = Stratified with surface cells that are larger and more rounded than those of the underlying layers
- Characteristics of transitional epithelium = Dome Cells
- Tubular structure having transitional epithelium and connective tissue with 3 layers of muscle and adventitia = Ureter
- Transitional epithelium is present in = Part of urethra

OTHERS

- A structure with ciliated and non-ciliated epithelium having three layers of muscles and tubular glands is = Fallopian tube
- One of the following transports foreign antigens across the epithelium in the digestive system = M-cells
- The air-blood barrier in the lung is formed by = Alveolar epithelium, capillary endothelium, and basal lamina
- A medical student is examining a slide under the microscope but he is unable to differentiate the gallbladder from the colon; the point which will help him in differentiating the gallbladder from colon histologically will = No submucosa in gallbladder wall
- A student was given a slide for microscopic examination. He concluded it to be mesothelium epithelium. The specimen could possibly be of = Lungs
- Pseudostratified epithelium properties = All cell bases are at the basement membrane
- Type of cell with no basement membrane = Ependyma
- Which epithelium has no basement membrane = Ependyma
- The GIT epithelium regenerates itself after how much time = 2-7 days
- A 28-year-old male executive presents to the doctor with complaints of "heartburn" non-responsive to usual medicines. Undergoes endoscopy with biopsy of the distal esophagus is taken. What type of mucosa is normal for the distal esophagus = Non-keratinized, stratified squamous epithelium
- Proximal convoluted tubule of nephron is different from other parts of the nephron especially by = Brush border epithelium
- Histological slide of salivary gland showing mucus acini with serous demilunes = Submandibular gland
- Epithelium modification in small intestine = Microvilli
- Regarding Goblet cells = In columnar epithelium

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445. STRATIFIED CUBOIDAL EPITHELIUM ARE PRESENT IN IN=SWEAT GLAND DUCTS

KNOW THE DIFFERENCE.

- Stratified cuboidal epithelium are present in in=Sweat gland ducts
- Stratified columnar epithelium is present in=Ducts of large salivary gland

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446. A MEDICAL STUDENT IS EXAMINING A SLIDE UNDER THE MICROSCOPE BUT HE IS UNABLE TO DIFFERENTIATE THE GALLBLADDER DIFFERENT FROM THE COLON; THE POINT WHICH WILL HELP HIM IN DIFFERENTIATING THE GALLBLADDER FROM COLON HISTOLOGICALLY WILL BE=NO SUBMUCOSA IN THE GALLBLADDER WALL

KNOW THE DIFFERENCE

- A student was examining a slide under microscope. He found mass of lymphoid tissue covered with simple cuboidal epithelium. The structure he is examining is=Payer's patches
- A student was studying slide of a lymphoid organ with partial covering of stratified squamous epithelium. Most likely structure is=Palatine tonsil
- A student observing a histology slide of a slide tubular structure with thick vascular wall and pseudostratified epithelium. Most likely the slide is of which structure=Vas deferens
- A medical student in a histology examination gets a slide showing non keratinised stratified squamous epithelium, a very vascular and elastic lamina propria and a muscle layer but no muscularis mucosae and glands. The most likely structure is=Vagina

HE EPITHELIUM OF TERMINAL BRONCHIOLE IS MADE UP OF= SIMPLE CUBOIDAL WITHOUT GOBLET CELLS

PRE-TERMINAL BRONCHIOLES CONTAIN EPITHELIUM= SIMPLE COLUMNAR CILIATED EPITHELIUM

ARDING BRONCHIOLES EPITHELIUM

Primary bronchioles/ Preterminal	Simple ciliated columnar to simple cuboidal
Terminal bronchioles	Simple cuboidal
Respiratory bronchioles	Simple cuboidal except where interrupted by alveoli
Alveolar ducts and alveoli	Simple squamous

VERY SMALL LUMEN, 3 TO 4 THICK MUSCULAR LAYERS AND ADVENTITIA AND INTERNAL LAMINA DESCRIBES HISTOLOGY OF WHICH STRUCTURE= MUSCULAR ARTERY

ME QUESTIONS RELATED TO HISTOLOGY

- Alcoholic liver histology= Mallory bodies
- Histology of uterus shows large tortuous glands with thick smooth muscles and increased vascularity. What is the phase of cycle= Late secretory
- Histology of vagina= Elastic fibres are abundant
- Histology Parietal cell of stomach= Eosinophilic cytoplasm and central nucleus
- The histology of thin ascending limb of loop of Henle= Flat epithelium
- Autoradiography in histology, uses which technique= Radioactive ions
- Germinal centers, lobules and histology= Lymph node
- Characteristic feature of nasal polyp on histology= Eosinophilia
- A pt having nasal polyps, which of following is most likely= Eosinophilia
- Most likely primary site for metastatic lung cancer with histology of sheets of clear cells=Renal
- A tumor of Vermis in child. Histology was given, true rosettes present. Diagnosis=Medulloblastoma
    - Pseudo Rosettes = ependymoma
    - Homer Right Rosettes or true rosettes = Medulloblastoma
- Child with soft tissue tumor. On Histology, Vementin +ive. Diagnosis= Rhabdomyosarcoma
- Histology of tissue with Mesothelium and fibrous element present= Lungs
- Histology of a structure with less amount of smooth muscle= Cervix

HOW MACULA DENSA CELLS ARE DIFFERENT FROM SURROUNDING CELLS= DEEP BASAL LAMINA

NOTE SOME PAST PAPER MCQS

- Decrease delivery of Na to macula densa causes release of= Renin
- Stimulant for renin release= Sympathetic stimulation
- Histology of Macula densa= Deep basal lamina
    - It also comes as
        - Histology of Macula Densa= Large cells with prominent nuclei & scattered mitochondria in periphery
- Concentrated Urine is formed when= Decrease plasma flow to macula densa

BIOCHEMISTRY

451. A FACTOR WHICH IS PRECURSOR TO THE CARRIER OF 1-CARBON FRAGMENTS AT VARIOUS LEVELS OF OXIDATION= BIOTIN

KNOW THE DIFFERENCE.

- Factor involved in 1 carbon transfer= Folate

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452. SULFUR CONTAINING AMINOACIDS =CYSTINE

REMEMBER THIS ABOUT AMINO ACIDS

- Amino acids deficiency causing cell injury= Glycine
- Amino acids causing cell injury= choline
- Threonine does not contain: Sulfa group.
- Sulfur containing amino acids= Cysteine and methionine
- Amino acid causes cell injury
- Amino acid causes renal stones= lysine
- Amino acid in abnormal metabolism= tryptophan
- Ketogenic amino acid is= lysine

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453. VITAMIN RESPONSIBLE FOR DELAYED WOUND HEALING= VITAMIN C DEFICIENCY

REMEMBER THE OTHER VITAMINS CAUSES AND EFFECTS OF DEFICIENCY

Vitamin	Uses & Deficiency
Vitamin A	• Night blindness, Corneal degeneration, Bitot spots • Prevents squamous metaplasia
Vitamin B1 (thiamine)	• Wernicke-korsakoff syndrome: confusion ophthalmoplegia, ataxia • Dry beriberi: Peripheral neuropathy, symmetrical muscle wasting • Wet beriberi: high cardiac output failure (dilated cardiomyopathy)
Vitamin B2 (Riboflavin)	• 2 C's: cheilosis and corneal vascularization
Vitamin B3(Niacin)	• Hartnup disease: • Pellagra: 3D's: ○ Diarrhea, Dementia, and Dermatitis (collar rash-like necklace) • Used to treat dyslipidaemias
Vitamin B5 (Pantothenic acid)	• Dermatitis, alopecia
Vitamin B6 (Pyridoxine)	• Peripheral neuropathy • Convulsions • Sideroblastic anemia
Vitamin B7 (Biotin)	• Fatty acid oxidation
Vitamin B9 (Folate)	• Found in leafy vegetables • Absorbed in jejunum • Deficiency causes macrocytic megaloblastic anemia. • ↓ seen in alcoholism and pregnancy
Vitamin B12 (cobalamin)	• Macrocytic megaloblastic anemia, Nerve damage • Found in animal products • Large reserve pool → 3-4 years in liver

Vitamin C (Ascorbic acid)	• Anti-oxidant • Facilitates iron absorption • Necessary for hydroxylation of proline and lysine in collagen synthesis • SCurvy due to Collagen synthesis defect
Vitamin D	• Vitamin D forms: ○ 25-OH D3 = storage form. ○ 1, 25-(OH)$_2$ D3 (calcitriol) = active form. ○ Rickets (children) ○ Osteomalacia (adults)
Vitamin E (tocopherol)	• Anti-oxidant • Can enhance the anti-coagulant effect of warfarin • Deficiency causes hemolytic anemia, muscle weakness
Vitamin K (K is for Koagulation)	• Blood clotting • Synthesized by intestinal flora • Necessary for maturation of factors 2, 7, 9, 10 and protein c and s • Neonatal Hemorrhage

NOW LET'S PRACTICE SOME PAPER MCQ'S

VITAMIN A

- Vitamin A= Retinol
- Hypervitaminosis A causes= Dry skin (Ref First aid, topic Vitamin A, pg. 62, edition 2017)
- Cost effective for vitamin A= Dietary analysis
- Role of vitamin A= Integrity of germinal epithelium
- Earliest Sign of deficiency of vitamin A= Conjunctival xerosis
    - Remember few were saying night blindness
        - Night blindness is a symptom not a sign

VITAMIN B

- Vitamin required for synthesis of cofactor A= Pantothenic acid
- Pellagra is associated with which vitamin= Niacin
- Vitamin that causes transamination of alanine and aspartate= Vit B6
- Diarrhea, dementia, dermatitis caused by deficiency of which vitamin= Niacin
- Glutamate aminotransferase and alanine aminotransferase formation use which vitamin as co-factor= B6
- Which vitamin act as cofactor in oxidation of fatty acids = biotin
- Cheilosis, seborrhic dermatitis, corneal vascularization. Which vitamin is deficient= Riboflavin
    - It also comes as
        - Cheilosis, corneal vascularization and glossitis is caused due to deficiency of= Riboflavin
        - Cheilosis, scaly dermatitis and gingivitis occurs with deficiency of=Riboflavin
- Beriberi is caused due to deficiency of= Thiamine
- Pellagra caused by deficiency of which vitamin= Niacin
- An alcoholic pt presents with peripheral neuropathy. Mostly likely due to deficiency of=Vit B1
- Transamination of AST and ALT requires which co factor=Vit B6
- Which Vit deficiency cause Homocysteinemia=Vit B12
- Homocysteine level increases in which vitamin deficiency=Vit B12
- Which of the following are observed in thiamine deficiency=Low RBC transketolase activity
- The highest cardiac output is recorded in = Beriberi
    - It also comes as
        - High cardiac output failure is caused by a deficiency of = Thiamine

VITAMIN D

- Which of the following metabolite of vitamin D can be used to assess the level of vitamin D= 25 hydroxyvitamin D
- Laboratory measurement of Vit D involves which metabolite= 25-OH vit D
- CRF pt with hypocalcemia and hyperphosphatemia. Which hormone test to be done next= 25 hydroxyl D
- Richest source of vitamin D=Cod liver oil
- In chronic pancreatitis, which vitamin will be deficient= Vit D
- A child came to you to OPD with bowing of legs and decrease osteoid matrix. Deficiency of=Vit D
- Deficiency of Vit D in adults causes=Osteomalacia

VITAMIN C AND E

- Important vitamin for bone regeneration= Vitamin C
- Which one of the following is seen in vitamin C deficiency=Scurvy
- Fisherman with gums hypertrophy and bleeding. Deficiency of which vitamin= Vit C
- Vitamin E deficiency causes= hemolytic anemia (Ref First aid page 70 Ed: 2019)
- People with only fish and meat and no fruits in their diet will have= Vitamin C Deficiency
- A 30-year-old fisherman presented with swelling of gums and purpura. He is most likely suffering from deficiency of which vitamin=Vit C

VITAMIN K

- A patient develops prolongation of PT and APTT with normal platelet count after administration of antibiotic. What should be given in treatment=Vit K
- Pregnant lady using lots of antibiotics. Gives birth to a baby. The baby has jaundice and easy bruisability. What is deficient=Vitamin K
- A premature newborn baby presented with Jaundice and easy bruising. There is history of intake of continuous antibiotics by mother which vitamin will be deficient= Vit K

OTHERS

- Carbohydrates source in diabetic patients= whole wheat
- Assessment of basal nutritional status by= Serum albumin and TIBC
- Assessment of nutritional status of person after weight is by= Serum albumin & TIBC
- Dietician advices for vitamins, what should one add in their diet= Fruits
- Most important constituent of Lipids= Carbon

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454. IF PERSON TAKES PROTEIN IN DIET, IT IS NECESSARY FOR HIM TO TAKE = RIBOFLAVIN (B2)

REGARDING DIET:

- If person takes protein in diet, it is necessary for him to take = riboflavin (B2)
- If person takes carbohydrate in diet, it is necessary for him to take = thiamine (B1)
- If person takes fats in diet, it is necessary for him to take = biotin(B7)
- Minerals not found or minerals with low bioavailability= tubers

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455. MOST ESSENTIAL FATTY ACID IN BODY= LINOLEIC ACID

NOTE THE FOLLOWING.

- Sodium neutralization: Cl
- HCO3 neutralization: k
- Amino acids:
    - Amino acids deficiency causing cell injury: Glycine
    - Threonine does not contain: Sulfa group.
    - Sulphur containing amino acids= Cysteine
    - Histones have arginine and lysine
    - alpha amino group of non-essential amino acids is derived from= glutamate

- Essential fatty acids: (cannot be synthesized in body must be obtain from diet)
    - Linoleic acid
    - Linolenic acid
- Major source of unsaturated fatty acids is= Soy bean oil

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456. A 30-YEAR-OLD MALE IS ON TOTAL PARENTERAL NUTRITION FOR THE LAST 1 MONTH DEVELOPS SCALING DERMATITIS AND ALOPECIA. THE CONDITION IS MOST LIKELY TO BE DUE TO DEFICIENCY OF= LINOLEIC ACID

ABOUT TPN REMEMBER THESE HIGHLY REPEATED MCQS

- A lady had colostomy and was put on total parenteral nutrition (TPN). She is prone to develop which of the following initially= Hyperglycemia
- TPN is contraindicated in= Uncontrolled DM

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457. TOTAL NUMBER OF ATP PRODUCED BY ONE GLUCOSE=38

NOTE:

Glycolysis	❖ Pathway that converts glucose $C_6H_{12}O_6$, into pyruvate or lactate ❖ Key Rate limiting enzyme is ○ Phosphofructokinase ❖ Net product in aerobic glycolysis → Pyruvate ❖ Net product in anaerobic glycolysis → Lactate ❖ Pyruvate then enters the Krebs citric acid cycle
Krebs Citric Acid Cycle or TCA cycle	❖ Pyruvate → acetyl-CoA → citrate→>oxaloacetate ❖ Main and central cycle for the oxidation of carbohydrate, proteins and lipids ❖ No ATP is utilized in this cycle ❖ Complete oxidation of one acetyl Co-A yields 12 ATP's. ❖ Rate limiting enzyme ○ Isocitrate dehydrogenase, (which converts Isocitrate to α-ketoglutarate)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Irreversible step in Glycolysis =. Fructose 6 –phosphate to fructose 1,6 - bisphosphate
- The glucose molecule present in glycogen side chain is metabolized by which enzyme=Glucose 1 phosphorylase
- Which step is common in both glycolysis and gluconeogenesis= Conversion of Fructose-1, 6-bisphosphate to fructose 6 phosphate
- Mitochondria is needed for glycolysis because= Pyruvate dehydrogenase in present in mitochondria
- In the presence of oxygen, end product of glycolysis is= 2 mol of pyruvate

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458. HIGH ENERGY SOURCE AMONG THE FOLLOWING= FATS

NOTE THAT

- 1gm Protein gives= 4 calories per gram
- 1gm Carbohydrate gives= 4 calories per gram
- 1gm Fat gives = 9 calories per gram

ALSO NOTE THE FOLLOWING THAT CAME IN PREVIOUS 5 YEAR PAPERS

- What is the total iron requirement In pregnancy= 1000mg
- Normal amount of iron In adult female is=2g
- O2 requirement in a 70kg adult =250 mL/min

- Calcium requirement in pregnancy is= 1200
- Kcal/kg required daily= 25-30 kcal/kg
- Cereal calories count per 100gram= 350-400
- Daily requirement of protein in healthy adult= 1gm/kg
- High energy source among the following= Fats
- During embryo development main source of energy= Glucose and fatty acids (there was no option of glucose and amino acids if that is present choose that)
- Which amongst the following is dietary requirement in a balanced diet= Protein Carbs Lipid
- In basal metabolism heart derives 60% energy from=Fatty acids
- Major energy reservoir in the humans is=Adipose triglycerides
- Highest content of sodium is in=Cup of soup
- Which one of these use fats for energy=Insulin
- Source for metabolic fuel for liver in post absorption state is=Fatty acids

459. FAT COMPOSITION OF DAILY DIET= 25-30%

USUALLY ASKED, REMEMBER

- Fat: 20-35% of total daily calories from fat.
- Protein: should make up about 10-35% of total daily calories.
- Carbohydrates: should make up about 45-65% of total daily calories.

460. AN ENZYME WHICH JOINS TWO MOLECULES TOGETHER IS A FUNCTION OF= SYNTHETASE

ABOUT ENZYMES SOME KEY POINTS

- Enzymes lower Energy of Activation
- Synthase/synthetase Joins two molecules together using a source of energy
- Enzymes for CholesteRol synthesis – HMG CoA Reductase
- Enzymes for KetogeneSiS -- HMG CoA Synthetase
- Fructose intolerance have deficiency of -- Aldolase

NOW SOME PAST PAPER MCQ'S

- Enzymes act by=Decreasing the activation energy
- Function of enzyme= Decrease activation energy of reactants
- Deficiency of which of the following enzyme result in prostate atrophy=5 alpha reductase
- Which of the following is true about Rickettsia= It has limited energy production and doesn't have glycolytic enzyme
- Which proteolytic enzyme not present in pancreatic secretion is= Aminopeptidase
- Which of the following enzymes do the brush border epithelial cells of small intestine secrete=Lactase
- A patient presented with acute chest pain for 4 hours. The specific enzyme raised in blood will be= Trop I
- Which is the most important enzyme secreted in gastric juice= Pepsinogen
- Decrease brush border enzyme results in= Lactose intolerance
- Which of the following enzymes take part in hepatic conjugation of bilirubin=Glucuronyl transferase
- Which of the following enzyme will be raised in Biliary obstruction and parenchymal necrosis=ALP
- Which of the following serves as a co-factor in synthesis of co enzyme A=Pantothenic acid
- Enzyme responsible for DNA replication= Telomerase
- Enzyme only metabolizing norepinephrine=Dopamine beta-hydroxylase

461. WHAT IS THE % OF WATER INTRACELLULAR= 60-70

NOTE THE QUESTIONS USUALLY ASKED ABOUT PERCENTAGES AND VALUES

- At Sea level the saturation of O2 in blood of normal adult is= 97%
- 80% oxygen saturation is in= Umbilical vein

- Energy expenditure in inspiration= 5%
- % of O2 used by brain at rest is= 20%
- % of HbA2 is adult is= 3%
- Respiratory quotient= 0.8
- Angle of axis of head of femur with long axis of shaft of femur= 125
- % of Total body water in neonates is= 75%
- In a neonate of 5kg weight, the estimated blood volume will be= 420ml
- Infant heart rate= 110 to 150
- Which of the following is a lactic acid oxygen debt=3.5 Litre
- P(A-a) at 100 % oxygen is 240mmHg, how much oxygen will be shunted=5 %
- 1 g Hb is bound to how much O2 in mL=1.34
- During 1st min of apnea CO2 will rise by=6mmhg
- Normal cerebral blood flow=750ml/min
- Fat content in adult male is=17%

CHAPTER # 17

PHARMACOLOGY

462. DRUG OF CHOICE FOR MOTION SICKNESS IS= SCOPOLAMINE

REMEMBER THESE MCQs

- ✓ Air sickness = Cyclizine
- ✓ Mountain sickness =Acetazolamide
- ✓ Morning sickness =Pyridoxine
- ✓ Motion Sickness= Scopolamine (Scopolamine >Meclizine > Promethazine)

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463. DOC (DRUG OF CHOICE) FOR DIABETIC PATIENT WITH HYPERTENSION = CAPTOPRIL

ALSO NOTE

Condition	Drug of Choice
Partial seizures	Carbamazepine (Phenobarbital in neonates)
Tonic clonic seizure	Sodium valproate
Absence seizures	Ethosuximide
Myoclonic seizures	Sodium valproate
Status epilepticus	benzodiazepines (e.g., Lorazepam > Diazepam)
MRSA	Vancomycin>Linezolid
Ventricular Tachycardia + Inc heart rate	Amiodarone
Supraventricular tachycardia	Adenosine
ventricular fibrillation	Lidocaine/lignocaine
Hypertrophic obstructive Cardiomyopathy	β-blockers > Verapamil
Pregnancy induced hypertension	labetalol > hydralazine
Eclampsia	MgS04
Bacterial vaginosis (fishy smell vaginal discharge)	Metronidazole
Pregnant lady + thyrotoxicosis + first trimester	PTU
Pregnant lady + thyrotoxicosis + 2nd /3rd trimester	Methimazole
Upper GI bleed	Terlipressin>Octreotide

NOW LET'S SOLVE SOME PAPER MCQ'S

- In a pt. of asthma and IHD, which drug should be used to control B.P during an operation= IV nitroglycerine
- Patient with Ventricular Tachycardia, increased heart rate and abnormal QRS complex. Drug of choice= Amiodarone
- Drug of choice in MRSA is= Fusidic acid
    - In this MCQ there was no option of vancomycin or linezolid and among the options only Fusidic acid was the correct option
    - MRSA remain sensitive to Fusidic acid (Ref: Wikipedia and NCBI)
- Drug of choice for Hypertrophic obstructive Cardiomyopathy= Verapamil
- Drug of choice for absence seizure= Ethosuximide
- Eclamptic patient on OT table drug of choice for HTN= IV LABETALOL

- A female with fishy smell vaginal discharge, clue cells seen on microscopy. What is the best drug of choice= Metronidazole
- Female has burning pain during urination etc. She is diagnosed with having UTI. The organism on culture is identified as oxidase positive, non-lactose fermenting, greenish color, and fruity smell. What drug should be given against this organism= Ciprofloxacin (prefer ciprofloxacin over ceftazidime)
    - This is a scenario of UTI caused by pseudomonas
- A 5-month pregnant lady with thyrotoxicosis. Drug of choice is= Methimazole
- DOC for post MI ventricular fibrillation= Lignocaine
- The drug of choice for severe clostridium difficile infection is= Vancomycin (here as the word severe indicates vancomycin > metronidazole)
- DOC for pseudomembranous colitis= Vancomycin (No option of metronidazole—metronidazole>vancomycin)
    - First-line therapy is oral metronidazole for 10-14 days
    - If severe or not responding to metronidazole then oral vancomycin may be used
    - For life-threatening infections, a combination of oral vancomycin and intravenous Metronidazole should be used
    - If vancomycin + metronidazole in option prefer that
- Morphine=In terminal cancer patient
- A known CLD patient present with upper GI bleed. Management plan should be= IV Octreotide
- GI bleed DOC= Inj Octreotide (remember terlipressin >octreotide)
- A CLD patient presenting with hematemesis. The preferred immediate treatment is=Inj Octreotide
- Travelers' diarrhea DOC= Norfloxacin> Diphenoxylate
    - (Ref: American family physician journal by JOHNNIE YATES, 2005 Jun 1;71(11):2095-2100)
- Bacterial Vaginosis DOC= Metronidazole
- DOC for gas gangrene= Penicillin
- DOC for Neisseria Meningitides=Penicillin-G
- DOC for systemic fungal infection= Amphotericin-B
- DOC for Bee sting swollen face with periorbital edema= I/M adrenaline
- DOC for Gonorrhea= Ceftriaxone
- DOC in Bacterial meningitis= Ceftriaxone
- DOC for hypothyroidism= levothyroxine
- DOC for fungal sinusitis= Amphotericin B
- DOC as analgesic in acute pancreatitis= Pethidine
- Common drug used in nasal and sinuses fungal infection=Amphotericin B
- Drug appropriate for endometriosis= Medroxy-progesterone
    - Remember Medroxy-progesterone > Danazol
- Urinary incontinence. Drug of choice is=Oxybutynin
- Drug of choice in moderate to severe congestive heart failure=Captopril (Remember ACE-inhibitors have the highest mortality benefit in heart failure shown in more than 10 trials)
- Drug of choice in obsessive compulsive neurosis is=Clomipramine
- DOC for Ca breast in pre-menopausal lady = Tamoxifen (anti-estrogen)
- DOC for Ca breast in post-menopausal women = Anastrozole (aromatase inhibitor)
    - Tamoxifen is an estrogen receptor AGONIST in the uterus
    - Raloxifene is an estrogen receptor ANTAGONIST in the uterus
    - Tamoxifen for PRE menopausal women with high risk for breast cancer
    - Raloxifene for POST menopausal women with high risk for breast cancer
- DOC for Hirsutism = Cyproterone acetate (anti-androgen)
- The initial drug of choice treatment of influenza virus is= Oseltamivir
- DOC for Taenia Solium pork worm infestation=Praziquantel
    - It also comes as
        - A pt with Tenia Solium and Schistosoma infection. Drug of choice will be=Praziquantel

- A 10-year boy diagnosed with tapeworm infestation. The drug of choice will be=Praziquantel
- DOC for Taenia Solium pork worm infestation with Cysticercosis=Praziquantel

464. EFFECT OF DRUG ON A BODY =PHARMACODYNAMICS

NOTE THE FOLLOWING HIGHLY REPEATED QUESTIONS.

- PharmacoDynamics= Drug action on body
- Pharmacokinetics = action of body on the drug
- When asked Drug- drug interaction by click = pharmacokinetics + pharmacodynamics option
- Tachyphylaxis= Rapid decrease in responsiveness to drug
- Bioavailability= the fraction of the administered dose that reaches the systemic circulation

ALSO REMEMBER THAT

- Acidic drug binds to = Albumin
    - It also comes as
    - Plasma protein binds to= Acidic albumin drugs
- While Basic drugs binds to = glycoproteins

NOW LET'S PRACTICE SOME PAPER MCQ'S

- The phenomenon, according to which what the drug does to the body is called= Pharmacodynamics
- The phenomenon of action of body on the drug is called= Pharmacokinetics
    - It also comes as
        - Effect of Body on drug is termed as=Pharmacokinetics
        - Body response to drug is termed as=Pharmacokinetics
- Drug-drug interaction between Morphine and naloxone is an example of= Both pharmacokinetics & pharmacodynamics
    - It also comes as
        - Regarding drug-drug interaction, correct is= Both pharmacokinetics & pharmacodynamics
        - Pharmacokinetic interaction among drugs is exemplified by= Increase toxicity of methotrexate by aspirin
- Regarding plasma albumin= more readily binds with acidic drugs:
- Tachyphylaxis= diminished response develops rapidly
    - Tachyphylaxis is=Diminished response to a drug rapidly
- Regarding adverse effect of drug, which is correct= Variable
- Amount of drug which reaches the systemic circulation after administration is called= bioavailability
- Which of the following types of drugs will have maximum oral bioavailability= Largely hydrophobic, yet soluble in aqueous solutions
- First pass metabolism of a drug can be avoided, and bioavailability is improved if given=IV
- Max bioavailability of drug is via which route= IV (IV > Sublingual)
- Regarding Bioavailability=The amount of active drug reaching blood
- The bioavailability of the following antiemetic is highest=Metoclopramide
- Drug bind to albumin= Inactive until activated by liver
    - It is also asked as
        - Protein bound fraction of the drug is= Inactive
        - Plasma protein drugs related= Inactive until activated by liver

KNOW THE DIFFERENCE

- Pharmacokinetics drug-drug interactions = Thiazlde and LIthium
- Pharmacodynamics drug-drug interactions= morphine and naloxone

APEUTIC WINDOW = THERAPEUTIC DOSE RANGE

ALSO NOTE THAT:

- Therapeutic index
    - It is the ratio of dose that produces toxic effect to the dose that produces desirable clinical effect.
    - Greater the therapeutic index→ greater the safety of drug
    - It also come in BCQ as "**Safety margin of drug? =Therapeutic index**"
- Therapeutic window
    - The range between minimum clinical effect and maximum toxic effect
- Potency
    - It refers to the **concentration or dose** of a drug required to produce 50% of that drug maximal effect
- Efficacy
    - It refers to the **maximal response** produced by a drug "or"
    - It is the E-max achieved by drug
- Proband
    - First person coming to doctor in effected family

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Safety margin of drug= Therapeutic index
- Narrow therapeutic index drug? = Short half-life, early steady state
- The therapeutic index of a drug indicates its: = Safety profile
- Minimum absorption of drug from its site of absorption, for its desirable effect occurs if= Drug used for local action
- Regarding Acetaminophen most likely is= its therapeutic window is less than aspirin
- Therapeutic dose of a drug for a particular condition is determined by= Potency
- Better study of a drug can be done by knowing the=Plasma half-life
- Therapeutic dose of drug in clinic is decided on= Potency
- Therapeutic index of drug indicates= Safety profile
- Steep curve in dose response shows= Potency
- Regarding Steep dose concentration, correct is=Increased potency
- The maximum effect (Emax) achieved by a drug is a measure of its=Efficacy
- Thiopental has 15 min duration due to= Rapid distribution
- Steady state concentration of drug is achieved by= initially giving loading dose and then maintenance dose
- A man working in a pharmaceutical company has exposure to nitroglycerine. Every Monday he complains of headaches after returning from weekend. Cause is=Tolerance
    - Monday disease" in industrial exposure: development of tolerance for the vasodilating action during the work week and loss of tolerance over the weekend → tachycardia, dizziness, headache upon reexposure

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466. HALF-LIFE OF DOPAMINE IS 2 MIN. AT WHICH TIME THERE WILL BE CONSTANT LEVEL OF DOPAMINE IN PLASMA AFTER ADMINISTERING=9 MIN

EXPLANATION:

- The rule of thumb is that steady state will be achieved after 4-5 half-lives (97% of steady state achieved)
- So, 2 multiply 5= 10
- The closest option was 9 in CPSP papers.

ALSO REMEMBER THESE MCQS

- The half-life of a drug is 10 hours which Is given in a continuous infusion. The steady state will be reached in how many hours=40

- o (Reference – First aid --drug infused at a constant rate takes 4–5 half-lives to reach steady state--
  -The rule of thumb Is that steady state will be achieved after 5 half-lives----so 50 would have been a better option but as 50 is not there—40 is the closest option)

❖ A 45-year patient on digoxin therapy for CCF develop sign and symptoms of digoxin toxicity. Blood analysis show digoxin level to be at 4 nanogram/ml. How long should digoxin (plasma half-life 36 hours) be withheld so that the plasma level falls to a safe & therapeutically effective contraction of 1 nanogram/ml= 72 hours

- o Half-life is 36 Hours → In 36 hours, level reduces from 4 to 2 and in next 36 hours level would reduce from 2 to 1---so total 72 hours

---

467. CLEARANCE OF DRUG DEPENDS ON= HALF-LIFE IN PLASMA

REMEMBER:

- ➢ Half-life (t1/2)
  - o is the time that it takes for the plasma concentration or amount of drug in the body to decline by 50%
  - o It is expressed as
    - ▪ t(1/2)= (0.693 × Vd)/CL
- ➢ In first-order kinetics, a drug infused at a constant rate takes 4–5 half-lives to reach steady state. It takes 3.3 half-lives to reach 90% of the steady-state level.

# Of half-lives	1	2	3	4
% Remaining	50%	25%	12.5%	6.25%

NOW LET'S PRACTICE SOME PAPER MCQ'S

❖ The half-life of a drug refers to=How long it will take to metabolize one-half the drug

- o It also comes as
  - ▪ Half-life (t ½) is the time required to= Change the amount of a drug in plasma by half during elimination

❖ Drugs having short plasma half-life (T½) = Reach steady state concentration quickly

❖ "Plasma half-life" of a drug depends on its= Rate of clearance

- o It also comes as
  - ▪ Plasma half-life depends on= Renal clearance
  - ▪ Clearance of drug depends on=Half-life in plasma

❖ Better study of a drug can be done by knowing the= Plasma half-life

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468. WHICH OF THE FOLLOWING HORMONES HAS THE SHORTEST PLASMA HALF-LIFE= CATECHOLAMINES

❖ For this remember this point CPSP usually change options between catecholamines, GnRH, epinephrine and dopamine.

- ➢ Catecholamines half-life is approximately 1-2 min. Corticosterone half-life is 60–90 min, renin is 10–15 min; GnRH 2-4 mins; aldosterone is 20 min.

NOW LET'S PRACTICE SOME PAPER MCQ'S

❖ Which of the following hormones has the shortest plasma half-life= GnRH

❖ Which of the following hormones has the shortest plasma half-life= Catecholamines

❖ Which drug having shortest half-life and require continuous Infusion=Dopamine

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HALF-LIFE OF COBALT IS=5 YEAR

REMEMBER THESE MCQ'S

- Half-life of Caesium-137 is=33 year (In one paper option of 30 years was given only which is also correct)
- Half-life of Propofol in anesthesia, is = 4–7 hours
- Half-life of cimetidine is= 2 hours
- In patient breathing 100% O2, the half-life of Carboxyhemoglobin will be=2 hours
- The half-life on kanamycin in perilymph is=12 hours (Range 10-15 hours)

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470. FARMER ORGANOPHOSPHATE POISONING WHAT SHOULD BE GIVEN = ATROPINE (REMEMBER ATROPINE> PRALIDOXIME REF FIRST AID PAGE 239 ED: 2017)

ALSO NOTE THE OTHER ANTIDOTES FOR

- Acetaminophen → N-acetylcysteine (replenishes glutathione)
- Benzodiazepines → Flumazenil
- Heparin → Protamine sulfate
- Opioids → NalOxOne
- Warfarin → Vitamin K (delayed effect), fresh frozen plasma (immediate)
- Methotrexate = Leucovorin
- Beta blockers=Insulin + Glucagon
- Carbon Monoxide= 100% O2
- Tricyclic AntiDepressants = Sodium Bicarbonate
- Aspirin= Sodium Bicarbonate

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Antidote of morphine= Naloxone
- Flumazenil duration of action= 30–60 minutes
- Antidote of Paracetamol= Acetylcysteine
- Antidote of warfarin= FFP and Vit K
- Which of the following is the best route to give immediate antidote to drug= IV
- An unconscious Pt. with respiratory depression not responding to Naloxone. Most likely cause= Phenobarbitone
- Important adverse effect of protamine is= Hypotension
- Leucovorin is an antidote for=Methotrexate
- In drug overdose, the best route to administer antidote is= IV
- Scenario of unconscious patient landing in ER due to ingestion of large bottle of aspirin. What will increase the renal excretion of aspirin= Bicarbonate administration
- Common cause of increase bleeding time= Aspirin toxicity
- Patient came with Aspirin over dose having respiratory acidosis. Aspirin will be removed from system by=NaHCO3
- Aspirin toxicity can be treated with= NaHCO3

ALSO REMEMBER THESE

- Potassium depletion may cause=Rise in plasma bicarbonate
- In a person taking carbonic anhydrase inhibitors for 4 weeks now, what changes will occur=Decrease HCO3 in blood

ONE CREEPY QUESTION

- In arsenic poisoning from where will you take the soil of graveyard=Any side

---

471. ASPIRIN OVERDOSE CAUSES = ALKALOSIS

FEW OTHER HIGHLY REPEATED QUESTIONS ASKED ABOUT ASPIRIN

- Aspirin MOA= irreversibly inhibits cyclooxygenase (both COX-1 and COX-2), Also inhibits the production of thromboxane A2

- Aspirin toxicity initially causes respiratory alkalosis than metabolic acidosis—leading to coma then
    - If both coma and alkalosis are in option prefer alkalosis as first alkalosis occurs than coma
- Aspirin inhibits platelet aggregation by inhibiting cyclooxygenase and inhibiting thromboxane production
- Aspirin overdose causes: (*Mnemonic*: TRMCD)
    - Tinnitus, Respiratory alkalosis, Metabolic acidosis, Coma, Death

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Aspirin overdose side effect= Alkalosis
- Aspirin decrease fever by which mechanism= Decrease prostaglandin.
- Regarding Aspirin= thromboxane A2 inhibition
- Genesis for Long term Aspirin therapy. Inhibition of=Thromboxane A2.
- Which drug irreversibly inhibits the function of platelets= Aspirin
- Aspirin inhibit the thrombus formation and inhibit platelet aggregation by inhibiting which function= Thromboxane A2
- MOA of aspirin in MI is= Inhibition of thromboxane synthesis
- Low dose salicylate/aspirin is prophylactically given in CAD. MOA is= Thromboxane A2 inhibitor
- Which of the following NSAIDs are contraindicated in chronic liver disease= Aspirin
    - ***Paracetamol is safe in patients with chronic liver disease but a reduced dose of 2-3 g/d is recommended for long-term use. Non-steroidal anti-inflammatory drugs (NSAIDs) are best avoided because of risk of renal impairment, Hepatorenal syndrome, and gastrointestinal hemorrhage.

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472. ASPIRIN SHOULD BE STOPPED BEFORE SURGERY/ OR HOW MANY DAYS THE EFFECT OF ASPIRIN REMAINS= 7-9 DAYS

FOR DRUGS WHEN TO BE STOPPED BEFORE SURGERY

Drug	When to stop	How to remember
Aspirin	Stop 1 week before surgery	Remember 'A' is the 1st alphabet
Lithium	Stop 2 weeks before surgery	Remember 'L' is formed by 2 straight lines
MAO-inhibitors	Stop 3 weeks before surgery	Remember 'MAO' has 3 letters
Estrogen pills	Stop 4 weeks before surgery	Remember 'E' is formed by 4 straight lines

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473. MORE SELECTIVE FOR COX 2 THAN FOR COX 1? = MELOXICAM

NOTE:

- If asked more **selective** Cox-2 = Celecoxib
- If asked **potent** Cox-2 = prefer Meloxicam
- If asked both cox-I and COX-II **irreversible** inhibitor= Aspirin
- If asked both cox-I and COX-II **reversible** inhibitor= Diclofenac (and other NSAIDS)

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474. SAFEST DRUG IN 3RD TRIMESTER= CEFADROXIL

OTHER QUESTIONS RELATED TO PREGNANCY

- Pt developed vesicles on abdomen which later developed Into bullae. She had similar lesions in previous pregnancies. Diagnosis= Pemphigus gestationalis
- A pregnant lady develops some skin changes just like her uncle who is HCV positive. Which changes are most likely to occur= Spider telangiectasia and palmer erythema
- Secretion of following is not increased during pregnancy- GH
- Decrease GH in pregnancy is due to= Human chorionic Sommatotrophin

- Which does not change during pregnancy= GH
    - Note
        - Initially in 1st half of pregnancy GH rises, then decreases in 2nd half, overall remains same
- A female with bleeding and coagulation defects. Intrauterine death has occurred. Management? Evacuation of uterus

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475. ANTI-EMETIC WITH HIGHEST BIOAVAILABILITY = METOCLOPRAMIDE

✓ While antiemetic that is preferred in patients of chemotherapy = Ondansetron

Also remember that

✓ Drug that increases LES tone and Increase Gastric emptying= Metoclopramide

✓ Ondansetron mechanism of action = 5-HT3 antagonist

NOW LET'S SOLVE SOME PAPER MCQ'S

- Mechanism of action of Ondansetron= serotonin type 3 receptor antagonist
- Diabetic gastro-paresis, drug to be given= Metoclopramide
- Drug which increase the competency of gastro esophageal junction= Metoclopramide
- One surgeon preparing Patient for laparotomy. But prior the surgery patient was complaining of nausea and vomiting. Which will be the best premedication in this case= Ondansetron
- Chronic diabetic patient having complaints of bloating etc. Doctor diagnosed as diabetic gastroparesis. Which drug would be useful for her= Metoclopramide

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476. DEXAMETHASONE AS COMPARE TO HYDROCORTISONE = IMMUNOSUPPRESSION

- Dexamethasone is a long acting, causes immunosuppression much more than hydrocortisone, although it does causes hyperglycemia but immunosuppression effect is more, so if both in options prefer immunosuppression

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477. MODE OF ACTION OF CEPHALOSPORIN = INHIBIT TRANSPEPTIDASE

REMEMBER ALL THE QUESTIONS THAT CAME IN PREVIOUS PAPERS RELATED TO MECHANISM OF ACTION

- Acetozomalamide MOA = H+ secretion
- Ondansetron MOA = 5-HT3 antagonist
- Aspirin MOA= inhibits cyclooxygenase
- Verapamil MOA on heart? = Increases AV nodal delay
- Methyldopa MOA in hypertension: = Binds adrenergic receptor in CNS
- Acetozomalamide MOA = H+ secretion
- Neostigmine MOA = Inhibitor of cholinesterase
- Ondansetron MOA = 5-HT3 antagonist
- Aspirin MOA= inhibits cyclooxygenase
- BDZ MOA= Potentiate GABA
- Phosphodiesterase inhibitor MOA= Inhibit conversion of cAMP to 5 AMP
- Verapamil MOA on heart= Increases AV nodal delay
- Alpha methyldopa MOA= It Inhibits norepinephrine for post ganglionic neuron to act
- A patient taking Dicumarol can expect to have which of the following symptoms= Delayed blood clotting
    - Dicumarol (vitamin k depleter like warfarin)
- MOA of Captopril= Inhibit conversion of angiotensin 2
- MOA of Labetalol= Acts on both Alpha and beta receptors
- Pt presented with upper abdominal spasmodic pain after fatty food intake, relieved by dicyclomine. what is the MOA of dicyclomine= Act on M3 receptor
    - It also comes as

        - A lady has severe colicky pain relieved by giving Dicyclomine. This drug acts on=Muscarinic receptor
- MOA of Vancomycin= Causes change in bacterial component
- Cephalosporin MOA= Transpeptidase inhibition
- Cyclosporine anti-tumor effect MOA in transplant patients= Inhibit T cell differentiation
- MOA of nitroprusside= Direct on vessels
- MOA of clomiphene citrate= Ovulation induction
- MOA of adenosine on heart= Decreases AV conduction
- MOA of digoxin= Inc intracellular calcium
- MOA of acetazolamide= Decreases hydrogen secretion and increase excretion of Na and K
- Drug inhibit H/K ATPase pump = Omeprazole
- Drug decreases the TG levels the most = Gemfibrozil
- Potent veno-dilator = IV Nitroglycerine
- Arterio-dilators = Hydralazine, Minoxidil & Nifedipine
- Shortest acting benzodiazepines= Midazolam
- A drug which blocks adenylyl cyclase and inhibits cAMP can be used in the treatment of which disease= Vibrio cholera
- Drug acting through H-k ATPase pump= PPI
- Patient was given a drug which caused Inc. Ca^{++}, Which drug was given= Thiazide
    - It has also come as Thiazide drug side effect= Hypercalcemia (but if hypokalemia in options prefer that hypokalemia > Hyperuricemia>hypercalcemia)
- Clomiphene citrate Induces ovulation by working on= Hypothalamus
- Patient with gum bleed given ascorbic acid. Mechanism of ascorbic acid= Hydroxylation of proline and lysine
- Propylthiouracil mechanism of action is inhibiting oxidation of= Iodide
    - It also comes as
    - MOA of propylthiouracil = Inhibit release of iodine
    - Propylthiouracil mechanism of action= Inhibits thyroid hormone synthesis
        - Remember→ PTU → Block thyroid peroxidase, inhibiting the oxidation of iodide and the organification and coupling of iodine→ inhibition of thyroid hormone synthesis
- Mechanism of action of Itraconazole= Inhibit ergosterol synthesis
- Citrate is given to patient with renal calcium stones. What is the mechanism of citrate in this case= increases pH
- Mechanism of action of loop diuretic= Inhibit co transport system (Na/K/2Cl) of thick ascending limb of loop of Henle
- Clavulanic acid helps penicillin's in= Beta lactamase inhibitor
- Mechanism of action of cephalosporin= inhibits transpeptidase
- Mechanism of action of Allopurinol= Xanthine oxidase inhibitor
- Mechanism of action of captopril= Decrease TPR
- Patient with severe gastroenteritis develops hypokalemia. To treat hypokalemia, I.V potassium infusion is advised. MOA of I.V potassium infusion in this patient is through=Na-K pump
- MOA of acetazolamide= Decreases hydrogen secretion and increase excretion of Na and K
- Patient have unilateral pulsating headache with photophobia, nausea and vomiting. You gave a drug which have following MOA=5 HT agonist
- The Antipsychotic action of phenothiazine is on=Blocking dopamine receptors in limbic

ALSO NOTE THESE

- Reduces the size of prostate= 5 alpha reductase
- A young male who is on antiepileptic drugs now develops depression. What drug should be used to TX depression=Fluoxetine
- Adrenaline causes vasoconstriction through=Alpha 1 adrenergic receptor
- Naturally occurring alkaloids are=Morphine and Codeine

- ❖ Action on smooth muscle diuretic used in pulmonary edema= Furosemide
- ❖ Regular insulin is= Short acting chain mechanism

478. **WHAT INCREASE THE POTENCY OF LOCAL ANESTHESIA WHEN ADDED TO IT= 1:20000 EPINEPHRINE**

SOME IMPORTANT POINTS ABOUT ANESTHETIC DRUGS

- ✓ MOA of local anesthetic is=Block Na+ channel
- ✓ Local anesthetic agent decreases Hepatic blood flow → Halothane
- ✓ Local anesthetic agent increases Cerebral blood flow → Halothane > Desflurane > Isoflurane > Sevoflurane
- ✓ Local anesthetic agent for OPD use → Desflurane
- ✓ Local anesthetic decreases plasma esterase level → Procaine
- ✓ Shortest acting local anesthesia → Procaine, Chloro-procaine
- ✓ Intermediate acting local anesthesia → Lignocaine
- ✓ Longest acting local anesthesia → Ropivacaine, Bupivacaine, Tetracaine
- ✓ Widely used local anesthesia → Intermediate & Long acting
- ✓ Local anesthetic most toxic → Bupivacaine
- ✓ Anesthetic for breast (chest or ribs injury) → Bupivacaine
- ✓ Ropivacaine preferred over Bupivacaine → Less CNS toxic
  - **Signs of Bupivacaine toxicity:**
    - Early → Perioral paresthesia > Tinnitus
    - Mid → Hypotension
    - Late → Arrhythmias
- ✓ Combination used in general anesthesia → Halothane & NO
- ✓ Potent anesthetic with potent analgesic → Ketamine
- ✓ Potent anesthetic but weak analgesic → Propofol / Halothane
- ✓ Potent analgesic but weak anesthetic → N_2O (Nitrous Oxide)
- ✓ Anesthesia in asthmatic hemodynamically stable patient → Propofol
- ✓ Anesthesia in asthmatic hemodynamically unstable patient → Ketamine
- ✓ Anaesthetic causing malignant hyperthermia → Halothane + Succinyl-Choline
- ✓ Intrinsic activity of bronchodilation → Ketamine (used in asthma)
- ✓ Anesthetic drug causes cardiac stimulation, increase heart rate & B.P → Ketamine
- ✓ After spinal anesthesia, hypotension occurs. What is the cause? → Due to loss of vasomotor tone
- ✓ Local anesthetic cause methemoglobinemia/hemoglobinemia → Prilocaine
- ✓ Local anesthetic decreases risk of nausea and vomiting → Propofol
- ✓ More local anesthetic concentration in blood by → Intercostal block
- ✓ Type of regional anesthesia associated with greatest serum concentration of local anesthetic is → Intercostal
- ✓ Succinylcholine caused apnea due to → Absence of Psuedocholine-esterase

NOW LET'S SOLVE SOME PAPER MCQ'S

- ❖ Mechanism of action of local anesthesia= Blockade of sodium channels
- ❖ IV local anaesthetic with rapid metabolism and hence less Side Effects that can be is used in regional blocks= Mepivacaine
- ❖ Following local anesthetic cause methemoglobinemia=Prilocaine
- ❖ In a RTA a patient had chest injury resulting in 3rd and 4th ribs fractured. For prevention of pain which local anesthetic with long duration of action shall be advised= Bupivacaine
- ❖ Which short acting local anesthetic is given epidural in vaginal hysterectomy= Procaine
- ❖ Bradycardia is side effect of which anesthetic agent= Halothane
- ❖ Halothane causes malignant hyperthermia by=Continuous skeletal muscle contractions
- ❖ Which inhalation anaesthetic agent increases cerebral blood flow= Halothane
  - ○ All options which were given increases in cerebral blood flow remember the sequence for it halothane> desflurane> isoflurane> sevoflurane

- Which one is strongest anaesthetic but weak analgesic= Halothane
- Paramedian approach in spinal anaesthesia must pierce which of the following= Ligamentum flavum
- A patient on benzodiazepines is planned for cholecystectomy. What possible complications can occur during surgery because of benzodiazepines= Increased timing/dose for anaesthesia induction
- Decrease heat production during general anaesthesia is due to= Reduced skeletal muscle tone
- The metabolism of Tetracaine, a local anaesthetic, given in spinal anaesthesia is by= Hydrolysis by cholinesterase
- An asthmatic female had her hysterectomy done. Which post-op analgesic is preferred for her= Pethidine
    - Ref: oxford handbook of anesthesia 4th ed. Chapter 5, respiratory disease, table 5.3, page 101)
- Local anesthesia crosses placenta through= Simple diffusion
- Pt during inguinal hernia surgery developed respiratory depression and cyanosis, which anaesthetic drug is responsible= Pancuronium
- Ketamine is preferred as an anaesthetic agent for repeat burn dressing because= It produces profound analgesia
- A 30-year-old man presents for open reduction and internal fixation of a left radius fracture as an outpatient. He has smoked 1 pack of cigarettes per day for 12 years. The plan is general anesthesia with endotracheal intubation. Which one of the following agents is most appropriate for him= Sevoflurane
- A 60-kg 17-year-old man presents for open reduction and internal fixation of an ankle fracture. You discuss a general anesthetic for intraoperative management with a sciatic block via the popliteal approach. You decide to use 20 mL of 0.5% bupivacaine with 1:200,000 of epinephrine. How many mL of 1:1000 epinephrine should you add to your bupivacaine to reach the appropriate concentration= 0.1 mL
- A 28-year-old man presents for shoulder surgery. The patient had a documented episode of malignant hyperthermia in a previous surgery under general anesthesia. Which of the following neuromuscular blockers is contraindicated in this patient= Succinylcholine
- Which drug may be useful in the management of the neuroleptic malignant syndrome, although it can worsen the symptoms of schizophrenia= Bromocriptine

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478. RIVASTIGMINE= ACETYLCHOLINESTERASE INHIBITOR

NOTE ALL THE IMPORTANT PHARMACOLOGY RELATED MCQ'S

- Characteristic sign of penicillin allergy= bronchospasm
- Drug which case increase effect of anti-seizure drugs= Valproate
- Epinephrine release from adrenal medulla dilates blood vessels through=beta 2 agonist receptors
- Morphine is given to a patient; what effect will occur= Constipation
- Bupvicaine
    - lock sodium channel as ionized form
    - Bupivacaine safe dose= 150mg
    - Earliest sign of bupvicaine toxicity= Ringing of ears
- All antipsychotic same in = Antiemetic effect
    - It also comes as with different options
        - Antipsychotic are same in = Efficacy
- Lignocaine= prevents Na influx across membrane
- Analgesics causing tachycardia in therapeutic dose = Pethidine
- Good analgesic but week anaesthetic = Nitric oxide
- Breast carcinoma:
    - Tamoxifen (anti-Estrogen) drug used only when tumor is positive for Estrogen receptors given in pre-menopausal women
    - Anastrazole (aromatase inhibitor) = given in post-menopausal women
- Labetalol acts on= Alpha and Beta receptors

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478. BENZODIAZEPINES CAUSES = DEPENDENCE

REMEMBER THE FOLLOWING

Drug reaction	Causing drugs	Mnemonics
Teeth discoloration	❖ Tetra**cyclines**	**teethracyclines**
Nephrotoxicity/ ototoxicity	❖ Aminoglycosides (gentamycin), Vancomycin, loop diuretics, Cisplatin, amphotericin B	
Photosensitivity	❖ Sulfonamides, Amiodarone, Tetracyclines, 5-FU	SAT For photo
Hyperuricemia (gout)	❖ Pyrazinamide, Thiazides, Furosemide, Niacin, Cyclosporine	Painful Tophi and Feet Need Care
Osteoporosis	❖ Corticosteroids, depot medroxyprogesterone acetate, GnRH agonists, aromatase inhibitors,	
Gray baby syndrome	❖ Chloramphenicol	
Hemolysis in G6PD deficiency	❖ Isoniazid, Sulfonamides, Dapsone, Primaquine, Aspirin, Ibuprofen, Nitrofurantoin	**Hemolysis IS D PAIN**
Thrombocytopenia	❖ Heparin	
Megaloblastic anemia	❖ Hydroxyurea, Phenytoin, Methotrexate, Sulfa drugs	You're having a **mega** blast with **PMS**
Hepatitis	❖ T.B drugs (Rifampin, Isoniazid, pyrazinamide)	
Hepatic necrosis	❖ Acetaminophen, Halothane, Valproic acid	
Pancreatitis	❖ Didanosine, Corticosteroids, Alcohol, Valproic acid, Azathioprine, Diuretics (furosemide, Hydrochlorothiazide)	Drugs Causing A Violent Abdominal Distress
Pseudomembranous colitis	❖ Clindamycin, fluoroquinolones, Ampicillin, cephalosporins	
Diabetes insipidus	❖ Lithium, demeclocycline	
Dilated cardiomyopathy	❖ Anthracyclines (e.g., doxorubicin, daunorubicin); prevent with dexrazoxane	
Torsades de pointes	❖ AntiArrhythmics (class IA, III), antiBiotics (e.g., macrolides), anti"C"ychotics (e.g., haloperidol), antiDepressants (e.g., TCAs), antiEmetics (e.g., ondansetron)	**ABCDE**
Dry cough	❖ ACE inhibitors	
Pulmonary fibrosis	❖ Methotrexate, Nitrofurantoin, Carmustine, Bleomycin, Busulfan, Amiodarone	My Nose Cannot Breathe Bad Air
Also remember these	❖ Neuroleptic malignant syndrome—typical antipsychotics (haloperidol) ❖ Corneal opacities/deposits-------Chloroquinine ❖ Lens opacities/deposits--------chlorpromazine ❖ Retinal opacities/deposits-----Thioridazine ❖ Angina worsen by --------theophylline ❖ Cardiotoxicity and neurotoxicity-------theophylline ❖ Pseudomembranous colitis--------clindamycin and fluoroquinolones	

NOW LET'S SOLVE SOME PAPER MCQ'S

- Edrophonium most common adverse effect= Nausea
- Benzodiazepines causes = Dependence
- Corneal opacity is caused by= chloroquine
- Scenario of pt. with raised urea creatinine. Drug contraindicated would be=Gentamicin
- Side effect of Tricyclic antidepressant is=General tonic clonic seizures
- Neuroleptic malignant syndrome by= Haloperidol
- First sign of Lidocaine toxicity= Light headedness

- Angina worsen by which drug= Theophylline
- Drug causing peripheral neuropathy and pancreatitis= Diadenosine
- Before giving sodium valproate to pt check= LFTs
- Drug that cause pseudo membranous colitis= Clindamycin
- Protamine side effect= Hypotension
- Side effect of Ace inhibitor= Hyperkalemia
- Common side effect theophylline and nitrates=Tachycardia
- Which drug causes pancreatitis and peripheral neuropathy= Diadenosine
- Anti-HIV drug causing pancreatitis= Didanosine
- Common side effect of theophylline= Seizures
- Side effects of recombinant human growth hormone therapy include= Benign Intracranial hypertension

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479. THE DURATION IN WHICH A TRICYCLIC ANTIDEPRESSANT SHOWS ITS ANALGESIC EFFECT WHEN GIVEN TO A PATIENT WITH POST-HERPETIC NEURALGIA IS= 1-2 WEEKS

KNOW THE DIFFERENCE

- TCA analgesic effect → 1–2 weeks
- TCA antidepressant effect → 3–4 weeks

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480. A KNOWN CRF PATIENT PRESENTED IN OPD WITH FEVER, PAIN AND DISCHARGE FROM EAR. WHICH ANTIBIOTIC PRESCRIBED SHOULD BE GIVEN IN LOW DOSE OR WITH CAUTION=GENTAMYCIN

SOME MORE MCQS ABOUT DRUGS

- Thioridazine mechanism of action= Blocks dopamine receptors
- Which drug decreases the triglyceride levels the most= Gemfibrozil
- Side effect of Chlorpromazine= Dystonia
- Which drug causes fetal kidney damage in utero= Captopril
- Which of the following drug will increase the effect of diazepam= Fentanyl
- Which drug is most commonly distributed in the ECF is=Mannitol
- Opioids given in poisoning cause vomiting by=Stimulating chemoreceptors trigger zone
- The shortest acting anti-hyperglycemic agent is=Tolbutamide
- Epinephrine cause decrease in=Cutaneous blood flow
- A 42-year para ÷3 reported with heavy cyclic vaginal bleeding for the last 6 months. Her clinical examination was unremarkable. She had recent D&C and histopathology showed early secretory phase endometrium. What is the best standard first line of treatment= Mefenamic acid
- Side effect of giving first-generation histamine H1 antagonists is= Sedation
- Clavulinic acid is mixed with ampicillin because= Inhibit Beta lactamase
- Side effect of Morphine= Bradypnea and miosis
- Drug with the highest first pass metabolism is= Nitrates
- Bromocriptine causes decreased prolactin levels by acting on= Dopamine receptors
- An Epileptic drug which increases the effect of other Antiepileptic's when given together is=Valproic acid
- Which drug cause fatal excitation when given with MAO inhibitors=Pethidine
- Which drug has properties similar to atropine= Scopolamine

KNOW THE DIFFERENCE

- An elderly OBESE male was started on IV Gentamicin BD post laparotomy. Which of the following will be disturbed= Distribution
    - Obese= Distribution
    - Thin or lean= Excretion

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481. THIAZIDES OFTEN REDUCE THE EXCRETION OF= LITHIUM ION

ALSO REMEMBER THESE

- Serotonin syndrome can be frequently encountered when a person is receiving= Fluoxetine and tricyclic antidepressant
- The drug which has shown the greatest efficiency in the treatment of obsessive compulsive disorder is= Clomipramine
- A father brought his 41-year-old son with some personality changes & aggressiveness which usually normalizes between episodes and afterwards apologizes for his act, Drug of choice= Lithium
- Patient receiving antipsychotic therapy develop sore throat fever leukopenia most likely drug is= Clozapine
- Which of the following is an indication to stop lithium immediately in a patient already using it= When the lithium blood levels are more than 1.5mmol/L
    - Lithium toxicity generally occurs following concentrations > 1.5 mmol/L
    - Features of toxicity:
        - Coarse tremor (a fine tremor is seen in therapeutic levels)
        - Seizure
        - Acute confusion, coma
        - May cause rhabdomyolysis

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482. Which drug acts on Na+/K+ ATPase and its inhibitors= Digoxin

Also remember

- ✓ Hyperkalemia is caused by= Digoxin
- ✓ Digoxin toxicity increases with= Hypokalemia
    - Note that (it reduces the rate of Na+/K+ ATPase pump turnover and exacerbates pump inhibition due to digitalis)
    - Sometimes no option of hyperkalemia so remember--- Electrolyte disturbances such as hypomagnesemia, hypercalcemia, and hypokalemia lead to increased sensitivity to digoxin making toxicity more likely.
- ✓ Most commonly digitalis toxicity is due to= Concurrent use of potassium removing diuretic
- ✓ Digoxin act as= Inotropic

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483. Most dangerous side effect Belladonna alkaloid on children= Hyperthermia

Note the side effects of drugs that came in previous papers

- Protamine side effect= Hypotension
- Side effect of epidural analgesia= Hypotension
- Side effect of anti-lipidemic drugs= GI disturbances
- A patient has multiple drug allergies, now he has been given xylocaine what will occur= Sudden rise in temperature (Don't change the key to rash or mild syncope)
- Which drug at therapeutic dose causes Tachycardia= Isosorbide Dinitrate
- Person on oral anticoagulant for long time and INR well controlled between 2 and 2.5. Now he developed bilateral wheeze. His INR is now 5. Which drug was given along with anticoagulant to bring about this effect in INR= Ciprofloxacin
    - This questions also comes as with different options
        - Patient with chest infection on drug, come with deranged INR which drug is responsible= Clarithromycin
        - For this remember → p450 enzyme inhibitors in liver increase INR due to dec. metabolism of warfarin.
        - P450 inhibitors Mnemonic: **VICK'S FACE AllOver GQ STOPS** (inhibitors) ladies in their tracks
            - Valproate, Isoniazid, Cimetidine, Ciprofloxacin Ketoconazole, Sulfonamides, Fluconazole, Alcohol (acute), Chloramphenicol, Erythromycin (macrolides EXCEPT azithromycin), Amiodarone, Omeprazole, Grapefruit juice. Quinidine
- Patient post GA in recovery room stops breathing and is cyanosed. What drug caused this= Pancuronium

- Adverse effect of Chlorpromazine=Dystonic movement
- Side effect of clonidine when used in ICU anesthesia= Hypotension
- Side effect of Biguanides= Diarrhea
- Side effect of xylocaine= Syncope
- Terminal cancer to reduce side effects morphine is given along with= Paracetamol (decreases morphine consumption and decreases its adverse effects)
- Morphine side effect= Meiosis, bradycardia
- Case of endometriosis, she took Danazol 3 months back, side effect of drug= Hirsutism
- Biguanides side effects = Diarrhea and flatulence
- Most common side effect of cholinergic drugs= Bradycardia
- Thrombocytopenia is a side effect of= Thiazides (Remember heparin>Quinine>thiazide)
- A pt on psychiatric medications develops agitation and visual impairment. The drug most likely causing it is= Thioridazine
    - Note that Chlorpromazine—Corneal deposits; Thioridazine—reTinal deposits
- Most common risk of giving systemic steroid to diabetic patients is= Deranged diabetic control
- A DM patient was started on a new oral antidiabetic medication for the last 10 days, now he complaints of GI distress & metallic taste of the drug while taking, the most probable medication it is= Metformin
    - (Also Remember 2 special medications for Metallic taste, Metronidazole and Metformin======Met=Met & Met)
- Gray baby syndrome and aplastic anemia are the established side effects of=chloramphenicol
- Side effect of Tricyclic antidepressant is= seizures
- Isoniazid= Peripheral neuropathy
- Rifampicin= Orange-red color secretions
- Ethambutol= Optic neuritis (color blindness)
- Pyrazinamide= Hyperuricemia, gout
- Streptomycin = Vestibular (8th) nerve damage

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484. REGARDING CIMETIDINE-SUCRALFATE INTERACTION=SUCRALFATE DOESN'T LET CIMETIDINE GET ABSORBED

REMEMBER THESE HIGHLY REPEATED QUESTIONS ABOUT CIMETIDINE

- H2 blocker/cimetidine are given before C-sec because=Decrease Volume plus acidity of gastric content
- Mechanism of action of cimetidine= H2- receptor blocker on parietal cell
- Regarding cimetidine which is common adverse effect which causes it to be stopped= Gynecomastia
- The main difference between Cimetidine and Ranitidine is that Ranitidine= Is less likely to produce CNS toxicity
    - It also comes as
        - Ranitidine is different from cimetidine as= It has less CNS toxicity
        - Despite having the same MOA ranitidine is superior to cimetidine in because=Has less CNS side effects
- Side effect of cimetidine=inhibition of p450
- Effect of Warfarin is increased by= Cimetidine
    - It also comes as
        - The dose of Warfarin will have to be modified if the patient is receiving any of the following drugs= Cimetidine
        - How cimetidine increases warfarin effect= Dec hepatic clearance
        - Cimetidine may significantly prolong prothrombin time and may cause bleeding in patients on warfarin by= Decreasing the hepatic clearance of warfarin
        - Cimetidine frequent side effect= Hepatic enzyme inhibition
- H2 blocker (cimetidine) ineffective in= Zollinger Ellison
- Which drug reduces the metabolism of theophylline=Cimetidine
    - It also comes as

- The metabolism of theophylline is slowed by the concomitant use of =Cimetidine

CHAPTER # 18

EMBRYOLOGY

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485. ERYTHROPOIESIS OCCURS IN MIDDLE TRIMESTER MAINLY FROM = LIVER

REGARDING FETAL ERYTHROPOIESIS OCCURS IN:

- Yolk sac (3–8 weeks)
- Liver (6 weeks–birth)
- Spleen (10–28 weeks)
- Bone marrow (18 weeks to adult)
- HB formed by Yolk Sac= Gower

Young Liver Synthesizes Blood

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486. FETAL PERIOD STARTS AFTER WHICH WEEK =8TH

- **REMEMBER**
  - Embryonic period (sensitive to teratogens) → **3-8 weeks**
  - Fetal period→ **8 weeks onwards**
  - Gestational age = From 1st day of LMP up to date
  - Embryonic age = From 14 days (2weeks) after LMP up to date
- **ALSO REMEMBER**
  - Embryonic age is calculated 14 days after= First day of last normal menstrual period

SOME PAST PAPER MCQS

- Mother smoking in pregnancy will be hazardous to fetus in=3-8 weeks
- Crown rump length at 3 to 8 weeks=10-15mm^2 (Based on available options)
- Crown-rump length (sitting height) during 17-20 weeks of intrauterine development is most likely= 15 - 1 cm (Based on available options)
- Calculate the embryonic age, if the LMP is 15/11/2020 and today is 15/02/2021= 11 weeks
  - Embryonic age is calculated 14 days after= First day of last normal menstrual period
  - So total of 77 days (keeping in view 31 days of December and January total 77 days
  - Now in weeks = 77/7= 11 weeks

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487. WHAT IS THE FUNCTIONAL UNIT OF LIVER CALLED= HEPATIC ACINUS

DEVELOPMENT AND REGENERATION

- Hb 2nd trimester form from = Liver
- Liver damage and then regeneration by = Hepatocytes
- Liver resected in a 45 yrs. female. For regrowth of remaining hepatocytes into full-sized liver, what is required = Hepatocyte Growth Factor
- After partial hepatic resection, which cells are responsible for regrowth = Hepatic Derived Growth Factor
- In liver, what develops from endoderm of ventral foregut = Hepatocyte
- The liver develops from an endodermal diverticulum originating from = Ventral border of the terminal foregut
- The liver is derived from = Foregut
- The smallest functional unit of the liver = Hepatic acinus
- Sinusoids of the liver are lined by = Fenestrated endothelium
- Kupffer cells present in hepatic sinusoids are derived from = Mesoderm

488. AT WHICH STAGE NUCLEUS DISAPPEAR= LATE NORMOBLAST

NOTE THE STAGES OF ERYTHROPOIESIS (ESPECIALLY THE BOLD AND UNDERLINE LETTERS)

Cells	Main event
Cytoblast	
Pre-normoblast (pro-erythroblast)	❖ Synthesis begins. ❖ Nucleus and nucleoli present. ❖ Hemoglobin begins to synthesize (This feature is common between pro-erythroblast and early normoblast).
Early normoblast (a.k.a basophil erythroblast).	❖ Nucleoli disappear. ❖ **Hemoglobin synthesis** (Common feature. But if both are present in options I'll favour early normoblast, more).
Intermediate normoblast (a.k.a polychromatic erythroblast).	❖ Nucleus still present. ❖ Hemoglobin starts to appear
Late normoblast (a.k.a orthochromatic erythroblast).	❖ Final stage of late normoblast, **Nucleus disappears** ❖ **Max Hb production**
Reticulocyte	❖ Eject nucleus and becomes reticular ❖ **Max Hb concentration**
Erythrocyte	❖ Reticulum disappears. Cell attains biconcavity

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Nucleus disappears in which stage of erythrocyte= Late normoblast
- Hb synthesis occurs in= Early normoblast
- Max Hb concentration in which stage of Erythroblastosis= Reticulocyte
- Max Hb production in which stage of Erythroblastosis= Late normoblast
- Hb begins to appear in which stage= Intermediate normoblast
- Lowest Hb in a newborn is at which age=3rd month

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489. RATHKE'S POUCH DEVELOPS FROM= STOMODEUM OF FOREGUT

ALSO REMEMBER

- Ant. Pituitary (adenohypophysis)→ Develop from Rathke's pouch, which is an ectodermal diverticulum of the primitive mouth cavity (stomodeum).

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Anterior pituitary gland is derived from= Rathke's pouch
  - It also comes as
    - Development of anterior pituitary gland is from = Outpouching from stomodeum (primitive oral cavity)
    - If both in option—outpouching from stomodeum> Rathke's pouch

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490. PHYSIOLOGIC HERNIATION = 4-6 WEEK

491. ABOUT FETAL GUT ROTATION=270 DEGREE COUNTERCLOCKWISE

- Midgut Development:
  - 6th week—physiologic midgut herniates through umbilical ring
- Rotation of midgut
  - The midgut rotates by 90° around the axis by superior mesenteric artery and vitelline duct.

- During 10th week the herniated intestine loops returns to abdominal cavity, the midgut loop rotates counterclockwise by an additional 180°, thus making rotation of loop through a total of 270° counterclockwise

492. SECOND ARCH DERIVATIVE= STYLOHYOID LIGAMENT

REMEMBER ABOUT ARCHES (ESPECIALLY THE BOLD LETTERS)

Derivatives Of Pharyngeal Arches

Pharyngeal Arches	Artery	Nerve	Muscle	Ligament	Bones And Cartilage
First Arch 1st arch is maximal.	Maxillary artery	Maxillary branch of trigeminal nerve Mandibular branch of trigeminal nerve, chorda tympani,	Muscles of Mastication, Mylohyoid, Anterior Belly of digastric.		Maxilla Zygomatic. Palatine bone. Squamous part of temporal bone. Meckel's cartilage. Malleus, incus. Mandibular process
Second Arch (Key word= S)	Stapedial artery	**Facial nerve**	Muscles of facial expression. Posterior belly of digastric, Stylohyoid, Stapedius,	Stylohyoid Ligament	Stapes. Stylohyoid Upper part of body of hyoid bone Lessor horn of hyoid bone.
Third Arch (Key word= pharyng)	Internal Carotid artery. Common Carotid artery **Mnemonic=** C is 3rd letter of alphabet.	Glossopharyngeal nerve.	Stylopharyngeus		Greater horn of hyoid bone. Lower part of body of hyoid bone.
Fourth arch	Right subclavian Arch of aorta	**Superior Laryngeal branch of vagus nerve.**	Muscles of soft palate (except tensor veli palatine) Cricothyroid. Cricopharyngeus		**Thyroid cartilage** cricoid cartilage Arytenoid cartilage Corniculate Cartilage. Cuneiform Cartilage.
Sixth Arch	**Ductus Arteriosus** Right and left pulmonary arteries (proximal part)	**Recurrent laryngeal branch of vagus nerve.**	All intrinsic muscles of larynx **(except cricothyroid muscle)** Skeletal muscle of esophagus.		**Thyroid cartilage** Cricoid cartilage Arytenoid cartilage Corniculate Cartilage cuneiform cartilage

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Alcoholic mother with a baby with facial hypoplasia. Where does the defect lie embryologically= 1st arch
- 4th and 6th arch derivative= Thyroid
- Patent ductus arteriosus is derivative of= Left 6th aortic arch
- Derivative of 2nd pharyngeal arch= Stylohyoid ligament
- 2nd arch derivative= Styloid process of temporal bone
- Facial nerve is derived from= 2nd pharyngeal arch
- Which amongst these is a Derivative of Third branchial arch= Stylopharyngeus muscle
    - It also comes as
        - Which muscle is derived from 3rd pharyngeal arch= Stylopharyngeus
- Recurrent laryngeal nerve is derivative of which pharyngeal arch=Sixth arch
- Maxillary artery is a derivative of=1st arch

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493. STYLOHYOID IS INNERVATED BY= FACIAL

KNOW THE DIFFERENCE

- Stylohyoid ---Facial Nerve
- Sternohyoid---- Ansa Cervicalis

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494. CELLS HAVING MOST TELOMERASE ACTIVITY = GERM CELLS

ALSO NOTE THAT

- Primordial germ cells derived from= ectoderm (choose Epiblast if in option) epiblast > ectoderm

It also comes as

- Germ cell arise in yolk sac at 3rd week of intrauterine life. They originate from which of the following= Ectoderm
    - Primordial germ cells are derived from epiblast (Ref: Pg. 13, Langman Embryology (Ed 11th), Pg. 186, Gray's Anatomy (Ed 40th)
    - Though some investigators consider epiblast as primitive ectoderm, hence, ectoderm can be a choice as answer, if epiblast was not among the options.

ALSO REMEMBER THESE MCQ'S

- Telomerase most commonly present in the= Germ cells
- Germ cells incorporate at= 6th week
- Primordial germ cells of yolk sac migrate to gonadal ridges in which week=6th week
- In embryo Primordial germ cells are formed at= 3rd week of development
- Primordial germ cells settle in gonads from= Wall of yolk sac

OTHER MCQ RELATED TO GERM CELL LAYERS

- What are the germ cell layers present in second week of development= Epiblast and hypoblast
    - 2nd week = 2 layers = Epiblast and hypoblast
    - 3rd week = 3 layers= ectoderm, endoderm, mesoderm

ALSO, REMEMBER

- Laryngotracheal groove develop in which week=3rd week
- At 7-8 week mostly gonadal ridges of both sexes are same but what point will be different in boys=Testes descend with gubernaculum
- The undifferentiated germ cells found in the basal compartment of seminiferous tubules are called=Type A Spermatogonia

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495. OOCYTE WITH FLAT EPITHELIUM IS= PRIMORDIAL FOLLICLE

NOTE THE FOLLOWING MCQ'S ABOUT PRIMORDIAL FOLLICLE

- The primary oocytes complete their first meiotic division= Before ovulation

- After ovulation primordial Follicle ruptures, bleeds and becomes= Corpus hemorrhagicus
- Cell released by ovary at the time of ovulation is= Secondary oocyte
  - It also comes as
    - The oocyte released during ovulation is called=Secondary oocyte
- A primary oocyte surrounded by zona pellucida and corona radiata with fluid filled spaces is called=Secondary follicle
- Primary oocyte surrounded by granulosa cells and having fluid filled space= Secondary follicle
- Regarding Oogenesis= All primary oocytes complete their 1st meiotic division before Ovulation
- Primary oocytes are formed in 5th month in fetal life and start meiosis-1 but remain dormant until puberty in which sub phase of prophase= Diplotene
  - It also comes as
    - Primary oocytes remain arrested in the Diplotene which is a subphase of= Prophase
- Ovary has pool of follicles. Number of follicles developing in each menstrual cycle= 15-20 primordial follicles are stimulated and one is selected
- The secondary oocyte is formed under the influence of= FSH
  - Note that
    - At the start of the menstrual cycle, some 12-20 primary follicles begin to develop under the influence of (FSH) to form secondary follicles.
    - On day 14 of the cycle, a luteinizing hormone surge is triggered, this causes the secondary follicle to develop into a tertiary follicle
- Haploid number of chromosomes with haploid DNA are seen in=Spermatids
- The primary oocyte after first maturation division produces=One secondary oocyte and polar body
- Sperm penetration layers=Corona Radiate, Zona pellucida, Oocyte membrane
- Fertilin at head of sperm= Adherence of cap to the ovum
  - Fertilin → Adherence of sperm to ovum
  - Acrosin → acrosome reaction
  - Fertilin is a sperm surface protein with an essential role in fertilization. It is required for the migration of spermatozoa through the oviduct, for binding to the zona pellucida, and for efficient binding to the egg plasma membrane

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496. **PRIMITIVE STREAK MESODERM MIGRATES TO ANTERIOR ABDOMINAL WALL AND AROUND CLOACA. A RUPTURE OF THIS MESODERM CRANIALLY WILL PRODUCE = ECTOPIC ANAL OPENING**

497. **IF THE MIGRATION OF ECTOPIC PRIMITIVE STREAK MESODERM CELLS DOES NOT OCCUR AROUND CLOACAL MEMBRANE, IT WILL RUPTURE AND OPEN CAUDALLY AS= EXTROPHY OF BLADDER**

REMEMBER THESE MCQ'S

- Mesoderm defect Cranially → Ectopic anal opening
- Mesoderm defect Caudal → Exstrophy of bladder
- Urothelium in following condition will have great chance to convert to carcinoma= Exstrophy of bladder

---

498. **EXTRA-EMBRYONIC MESODERM DERIVED FROM =HYPOBLAST**

ALSO REMEMBER

- Exocelomic membrane derived from=Hypoblast
- Space between splanchnic and somatic mesoderm is= Extra embryonic
- Intraembryonic coelom is a derivative of= Lateral plate mesoderm

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499. **UTERUS AND VAGINAL EPITHELIUM DERIVED FROM =ENDODERM + MESODERM**

REMEMBER GERM LAYERS DERIVATIVES GENERAL RULES

Ectoderm	❖ Everything that makes you attractive: ○ Skin (epidermis), hair, nails, breasts, teeth enamel, lens, cornea etc.

	❖ Exocrine glands: o Sweat, sebaceous, mammary, parotid, lacrimal, etc. ❖ Nervous system: CNS and PNS o From Neural Crest of Ectoderm • Peripheral nervous system, Adrenal medulla, Melanocytes, Facial cartilage. o From Neural tube of Ectoderm • Brain, Spinal cord, Posterior pituitary, Motor neurons, Retina, Anterior pituitary
Endoderm	❖ Lining of tube from nose, mouth and ear to anus and urethra and vagina ❖ Internal organs: o Pharynx, thyroid, parathyroid, Trachea (epithelial parts), lungs, Stomach, intestines (mucosal layers), colon (mucosal layers), liver, pancreas, bladder
Mesoderm	Mnemonic **GONADS** ❖ **G**enitourinary and Renal ❖ **O**thers – Muscle, bone, connective tissue, serous lining of body cavities, cardiovascular system, parenchyma ❖ **N**otochord – **N**ucleus pulposus ❖ **A**drenal cortex ❖ **D**uramater ❖ **S**pleen

LET'S PRACTICE SOME PAPER MCQ'S

- Thyroid follicles are derived from= Endoderm
  - Or it also comes as
    - Thyroid gland originates from= Endoderm
- Parathyroid derived from= Endoderm
- Hepatocytes are derived from which layer= Endoderm
- Kupffer cells present in hepatic sinusoids are derived from=Mesoderm
  - Also note this
    - Liver having immunity is mainly due to=Kupffer cells
- In liver, what develops from endoderm of ventral foregut= Hepatocyte
- Salivary glands are derived from which layer= Endoderm and Ectoderm
- Endothelium of vagina and of endometrium derived from= Mesoderm plus Endoderm
- Nasolacrimal duct derived from= Ectoderm
- Epithelium is derived from= Ectoderm + Endoderm + Mesoderm (The epithelium is derived from endoderm, mesoderm and ectoderm (depending on the location))
- Urinary system derived from= Intermediate mesoderm
- Skeletal muscles develop from= Mesoderm only
- Ear pinna develops from= Mesoderm
- Ectoderm and Endoderm meet at caudal end forming= Cloacal membrane
- Which amongst the following is a Neuroectoderm derivative= Ciliary epithelium
- Derivative of Neural crest is= Dorsal root ganglia
- Derivative of parotid fascia= Stylomandibular ligament
- Which of following structures in the mouth is derived from Ectoderm= Epithelium of parotid gland
- Vertebrae is derived from= Sclerotome
- Adrenal Medulla derived from= Neural crest Cells
  - Remember
    - CM Adrenal c**O**rtex→ derived from mes**O**derm→**O**uter portion→ 80% of gland. MNA
    - Adrenal medulla→ derived from neural crest→inner portion→ 20% of gland
- Bicornuate uterus is associated with pathology in=Kidney

- Posterior lobe of pituitary gland develops from= Diencephalon

KNOW THE DIFFERENCE

- Epithelium of trigone of Urinary bladder derived from → Mesoderm
- Transitional epithelium of Urinary bladder derived from → Endoderm
- Epithelium of Urinary balder derived from → Mesoderm + Endoderm

500. **EMBRYOLOGICAL COUNTERPART OF MESONEPHRIC DUCT IS= SEMINAL VESICLES**

REMEMBER

EMBRYOLOGY OF GENITAL TRACT

Gonads	Ovary	Testis
Paramesonephric duct (Mullerian duct)	Uterine tubes, Uterus, Cervix, Hydatid of Morgagni	Appendix testis
Mesonephric duct (Wolffian duct)	Appendix vesiculosa, Duct of Gartner	Epididymis, Ductus deferens, Seminal vesicles, Ejaculatory ducts, Appendix epididymis
Mesonephric tubules	Epoophoron, Paroophoron, Paratubal cyst	Efferent ductules, Paradidymis
Phallus	Clitoris	Glans penis
Urethral folds	Labia minora	Ventral aspect of penis
Genital swellings	Labia majora	Scrotum

MCQS FAVORITES

Embryonic Structure	Female	Male
Genital ridge	Ovary	Testis
Genital swelling	Labia majora	Scrotum
Genital fold	Labia minora	Ventral aspect of penis
Genital tubercle	Clitoris	Glans penis

LET'S PRACTICE SOME PAPER MCQ's

- Mullerian duct develops into=Uterus and vagina
- Upper 1/3rd of vagina is derived from= Paramesonephric duct
- An 18 Years old girl with bicornuate Uterus is most likely due to which of the following abnormality=Paramesonephric duct
  - It also comes as
    - 18 years old girl having normal secondary sexual characters and having bicornuate uterus is most probably due to=Paramesonephric duct
- Paramesonephric duct derivatives in females=Uterine tube, uterus and upper part of vagina
- Counterpart of mesonephric duct in males= seminal vesicles, ductus deferens & ejaculatory duct
- Counterpart of Mullerian duct = - Seminal colliculus
- Counter part of rete testis= Rete ovary
- Embryonal counterpart of urorectal septum= Perineal body
- Female counterpart of labia majora= Scrotum
- Which of the following is a functional remnant of mesonephric duct in males= Seminal vesicle
- A mother brings her 5 years old daughter to the physician complaining that the child is well trained for toilet still seems to regularly wet herself. The physician orders an IV-pyelogram, which shows a complete duplication of the ureter on the right side. Although one ureter opens normally in to the bladder, the other opens ectopically in to the vagina. This congenital anomaly is caused by-Early division of the ureteric bud
- During the development of genital ducts, the remanant of Mullerian duct in males is= Appendix testis
- In human embryo, ureteric bud is formed as a part of= An outgrowth from mesonephric duct

501. HEPATOCYTES DEVELOP FROM= ENDODERM

REMEMBER:

- Smallest Functional unit of liver= Hepatic Acinus
- Glucokinase enzyme present in= Hepatocytes

502. DERIVATIVES OF DORSAL MESOGASTRIUM= GASTROSPLENIC LIGAMENT

REMEMBER COMMONLY ASKED BY CHANGING OPTIONS

- Derivatives of ventral mesogastrium
    - Falciform ligament
    - Right and left triangular ligaments
    - Coronary ligaments
    - Hepatoduodenal
    - Lesser omentum
- Derivatives of dorsal mesogastrium
    - Gastro phrenic ligament
    - Gastrosplenic ligament
    - Lienorenal ligament
    - Greater omentum

503. WHAT IS THE REMNANT OF GUBERNACULUM TESTIS= SCROTAL LIGAMENT

KNOW THE DIFFERENCE

- ✓ Gubernaculum remnant in female= Ovarian ligament

504. CORPUS LUTEUM MAINTAINS THE ONGOING PREGNANCY DURING= 1ST TRIMESTER

NOTE THE FOLLOWING

First Trimester	❖ The corpus luteum (stimulated by HCG) is responsible for the production of estradiol, progesterone and inhibn-A. ❖ Corpus luteum and the hormones secreted by it support the ongoing pregnancy initially for 9 weeks (range 8-10 weeks---Reference First aid Edition 2017, page 598) this is then taken over by the placenta
Second and Third Trimesters	❖ Progesterone is produced by the placenta. ❖ Estrogens are produced by the interplay of the fetal adrenal gland and the placenta.

NOW LET'S SOLVE SOME PAST PAPER MCQ'S

- The source of estrogen and progesterone during the last seven months of pregnancy is? = Placenta
    - It also comes as
        - Source of estrogen in the second and third trimesters? = Placenta
        - In the third trimester of pregnancy, estrogen and progesterone are produced by? = Placenta
        - In late mid-pregnancy, estrogen and progesterone are produced by? = Placenta
        - The placenta produces which hormone in the last trimester? = Estrogen and Progesterone
        - Last 7 months of pregnancy is maintained by? = Placenta
        - During the 7th month of pregnancy, estrogen and progesterone are produced by? = Placenta
        - Source of estrogen & progesterone in the last trimester is? = Placenta
        - In late mid-pregnancy, estrogen and progesterone are produced by? = Placenta
- Corpus luteum produces which hormone that maintains the pregnancy in the 1st trimester? = Progesterone
    - It also comes as

- In a 2-month pregnant female, progesterone is produced by? = Corpus luteum
- Corpus luteum supports pregnancy up to? = 1 to 8 weeks

- Which of the following will prevent involution of corpus luteum? = Endogenous chorionic gonadotropin
- Beta-HCG preserves? = Corpus luteum
- Corpus luteum normally secretes which of the following? = Estrogen, Progesterone, and Inhibin
- Which of the following is the function of beta HCG? = Preservation of corpus luteum
    - It also comes as:
        - Function of Beta-HCG in early pregnancy is? = Maintain corpus luteum
        - Most important function of HCG? = Prevent involution of corpus luteum
- Beta-HCG = Causes follicle maturation in female fetus
- Molecular weight of Beta-HCG? = 35–40
- To confirm a pregnancy, which of the following is checked in urine? = Beta HCG
- A young female with 6-week pregnancy passing vesicles? = Beta HCG > 1000

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506. FETAL COMPONENT OF PLACENTA IS FORMED BY= CHORION FRUNDOSUM

NOTE THE FOLLOWING ABOUT PLACENTA

Development of placenta	❖ Placenta develops from the chorion frondosum and the decidua basalis. ❖ Fetal placenta (Chorion frondosum), which develops from the same blastocyst that forms the fetus, and the maternal placenta (Decidua basalis), which develops from the maternal uterine tissue
Fetal Component	❖ **Cytotrophoblast** ○ Inner layer of chorionic villi. ○ Cytotrophoblast makes Cells. ❖ **Syncytiotrophoblast** ○ Outer layer of chorionic villi ○ Syncytiotrophoblast= Synthesizes and Secretes hormones, eg, hCG (structurally similar to LH; stimulates corpus luteum to secrete progesterone during first trimester).
Maternal Component	❖ **Decidua basalis** ○ Derived from endometrium.

NOW LET'S SOLVE SOME PAPER MCQ'S

- Fetal Component of Placenta is formed by= Chorion Frundosum
- hCG produced in late pregnancy by= Syncytiotrophoblast and fetal endothelium
- Placenta acts as a barrier for= Prevent mixing of maternal and fetal blood
- Placenta in normal state does which of the following= Prevents Mixing of maternal and fetal blood
- What is the fetal component of placenta providing most of the nutrition and gas exchange possible= Cytotrophoblast
- During last trimester separation of mother & fetus= Fetal endothelium & Syncytiotrophoblast
- Regarding human placenta= Separate from uterine wall due to rupture of uterine muscle
- At 20-week placenta act as strict barrier= Syncytiotrophoblast, connective tissue, endothelium of fetal tissue

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507. A PREGNANT LADY PRESENTED WITH LOWER ABDOMINAL PAIN, ON ULTRASOUND PLACENTA ATTACHES TO MYOMETRIUM BUT DOES NOT PENETRATE THROUGH IT= PLACENTA ACCRETA

NOTE

Placenta Previa	❖ Is a condition when placenta attaches in the lower part of uterus, covering the internal Os. ❖ It is the classic cause of 3rd trimester bleeding.

	❖ Ectopic pregnancy is the classic cause of bleeding in 1st trimester.
Placenta Accreta	❖ Is when placenta gets implanted in the myometrium (superficial aspect of the myometrium but without deep invasion)
Placenta Increta	❖ Is when placenta gets implanted deep into the myometrium
Placenta Percreta	❖ Is when the placenta gets implanted through the wall of the uterus

NOW LET'S SOLVE SOME PAPER MCQ'S

- Placenta attach but not invade myometrium= Placenta accreta
- Glucose transported through placenta= Facilitated diffusion
- About human placenta= Get Separated when there is rupture of uterine muscles
- The placenta is formed by = Chorionic frondosum and decidua basalis
- A pregnant female was attended in OPD and was noted to have severe anemia and hyperemesis gravidarum USG reveals twin pregnancy Other finding seen are = Two amniotic sac and a common placenta
- Under normal conditions, the placenta acts as a barrier against: = Mixing of maternal and fetal blood
- One of the following changes does NOT occur in pregnancy: = The placental permeability is maximum during the first trimester
- The chorionic villi of the placenta are most numerous in the region of the: = Chorionic plate
- Fetal blood leaving the placenta has what percentage of pO2 saturation? = 30%
- The gold standard test for low-lying placenta is? = Transvaginal ultrasound
- Placenta attached to myometrium but not penetrating it is? = Placenta accreta
- When the umbilical cord is attached to the placenta's margin, the type of placenta is = Battledore placenta
- Regarding human placenta = Separate from uterine wall due to rupture of uterine muscle
- Which hormone isr eleased from the intermediate pituitary lobe, hypothalamus, lung, and placenta? = Proopiomelanocortin (POMC)
- Oxygen in fetal blood leaving the placenta is = 30 mmHg
- Fetal blood leaving placenta has what percentage of PO2 saturation? = 30 mmHg

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508. SINUS VENOSUM DEVELOPS INTO= CORONARY SINUS

FETAL-POSTNATAL DERIVATIVES

AllaNtois → urachus	❖ MediaN umbilical ligament	Urachus is part of allantoic duct between bladder and umbilicus.
Ductus arteriosus	❖ Ligamentum arteriosum	
Ductus venosus	❖ Ligamentum venosum	
Left horn of sinus venosus	❖ Coronary sinus	
Foramen ovale	❖ Fossa ovalis	
Notochord	❖ Nucleus pulposus	
UmbiLical arteries	❖ MediaL umbilical ligaments	
Umbilical vein	❖ Ligamentum teres hepatis (round ligament)	Contained in falciform ligament

NOW LET'S SOLVE SOME PAPER MCQ'S

- In adults, median umbilical ligament is a derivative of= Urachus
- Median umbilical ligament is a remnant of= Urachus
- Patent lumen of Allantois form= Urachal fistula

- Note that
  - Total failure of Urachus to obliterate→ Urachal fistula
  - Partial failure of Urachus to obliterate→ Urachal cyst
  - Patent lumen superior or inferior only→ Urachal sinus
- Urine comes from umbilicus of neonates due to urachus fistula is due to= patent urachus
- Round ligament of liver is a remnant of= Umbilical vein
- At which week Doppler can detect umbilical artery flow on ultrasound= 8 weeks
- Changes that occur after birth= Ductus arteriosus converted into ligamentum arteriosum
- A new born with jaundice have to study upon his liver, dye should be given through his= ligamentum teres
- Free margin of falciform ligament contains= Ligamentum teres
- Left umbilical Vein Remnant= Ligamentum teres
- Ligamentous teres is= Obliterated umbilical vein
- Free margin of falciform ligament contains=Ligament teres
- The free border of the falciform ligament contains=The round (teres) ligament
- A gastroenterologist wants to inject a contrast medium into the liver for diagnosis. The structure most likely to be injected is= Ligamentum teres
- Ligamentum teres is a derivative of=Left umbilical vein
- Which of the following changes occur after birth=Ductus arteriosus is converted into ligamentum arteriosum
- Liver is attached with the anterior abdominal wall by= Falciform ligament
- Ligamentum arteriosum connects= Left pulmonary artery to arch of aorta
- Nucleus pulposus is remnant of= Notochord
- Remnant of Epiphyseal plate is= Epiphyseal line
- Tunica vaginalis is remnant of= Processes vaginalis
- Remnants of previous osteons, called= interstitial lamellae
- Remnant of Vitello intestinal duct may result in formation of=Meckel diverticulum

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ABOUT HUMAN UMBILICAL CORD= 2 UMBILICAL ARTERIES & 1 UMBILICAL VEIN

EMEMBER ABOUT FETAL CIRCULATION

- Contains the right and left umbilical arteries, carry deoxygenated blood from the fetus to the placenta.
- Contains left umbilical vein, which carries oxygenated blood from the placenta to the fetus and has highest oxygen saturation

OW LET'S SOLVE SOME PAPER MCQ'S

- 80% of oxygen saturation in fetus is present in= Umbilical vein
- In neonates, highest O2 saturation in which vessel= Umbilical vein
- Number of umbilical arteries in fetus= 2
- At which week can Doppler ultrasound detect umbilical artery flow/pulsation= 7 weeks
  - Actually its 7-8 week in many books---but week 7 alone is mentioned in many books too

→ vein is very saturated
Rt umbilical vein regresses

HYPOSPADIAS IS DUE TO DEFECT IN= UROGENITAL FOLDS

urogenital folds

EMEMBER

- Urogenital sinus forms→ Bladder, prostate and urethra
- Genital ridge forms→ Testis and Ovary
- Genital fold forms→ labia minora and ventral aspect of penis

HUCEEG → genital tubercle
hypospadias
epispadias
extrophy of bladder
Cryptorchidism

LET'S SOLVE SOME PAPER MCQ'S

- Urogenital sinus is divided into upper and lower part by= Cloaca
- Prostate marker released. Sample taken from which structure= Urogenital sinus

- A pt with well developed breast and secondary sexual characteristics but has primary amenorrhoea. What is the cause=Genital ridge abnormality
- Trigone of urinary bladder develop from = mesonephric duct
  - Note that.
    - Trigone of bladder develops from = mesonephric duct
    - Bladder except Trigone develops from = urogenital sinus
- Genital tubercle in females, forms which part=Clitoris
- Trigone of urinary bladder= Has ureteric orifices as oblique slits

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511. FORAMEN CECUM MARKS THE FORMATION OF WHICH STRUCTURE= THYROID

SOME GENERAL MCQ'S OF THYROID

- Which causes conversation of iodide in T4= Principal cell of thyroid
- Thyroid gland medial relation= Recurrent laryngeal nerve
- A child presented with midline swelling below Hyoid bone since two months after birth= Thyroglossal Cyst
- Epithelium changes shape with the activity of gland= Thyroid follicles
- Thyroid hormone packing= Golgi complex
- Relation of superior thyroid artery= Lies in front of isthmus of thyroid
- Which structure lies posterolateral of thyroid= carotid artery
- Derivative of foramen cecum is= Thyroid

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512. THYMUS DEVELOPS FROM = ENDODERM OF 3RD BRACHIAL POUCH

REMEMBER THAT

- Thymus and inferior parathyroid develops from: 3rd branchial pouch.
- While Superior para thyroid is developed from: 4th brachial pouch.
- Located in the anterosuperior mediastinum
- Important source of T-lymphocyte
- Site of T-cell differentiation and maturation
- Thymus blood supply= Inf thyroid artery & also by branches of the internal thoracic
- Diseases: CATCH 22q11
  - Hypoplastic in DiGeorge syndrome and severe combined immunodeficiency (SCID).
  - Thymoma—benign neoplasm of thymus, Associated with myasthenia gravis and superior vena cava syndrome

NOW LET'S PRACTICE SOME PAPER MCQ'S

- No Lymphatic nodule in= thymus
- Thymus= Rich in lymphocytes
- Which is lobulated lymphoid organ= Thymus
- About T lymphocyte= Mature in thymus after birth
- Cells diff in thymus to become= cytotoxic cells (it differentiated into both helper as well as cytotoxic, but if u have to choose one choose cytotoxic)
- 3rd pharyngeal pouch cell arise= Thymus
- Cardiac surgeon operating for patent foramen ovale. Which structure will he come in contact in anterior mediastinum when operating= Thymus
- Which prevent foreign antigen to gain access to developing lymphocytes= Blood thymus barrier
- During development, T lymphocytes are protected from autoimmune destruction by=Blood thymus barrier
- Structure that lies in anterior mediastinum= Thymus
- In a young child, immature T cells are present in which part of thymus=Cortex
- Immature T cells are present in which part of thymus= Deep paracortex

- Thymus at the age of 10 years=Extents from lower border of thyroid to 4th costal cartilage

KNOW THE DIFFERENCE

- Lymphoid mass with supporting structure= Spleen
- Lymphoid mass with no supporting tissue = Thymus
    - Ref: Junqueira's Basic Histology

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513. CHILD WITH HISTORY OF BED WETTING THOUGH TOILET TRAINED INVESTIGATIONS DONE AT ONE SIDE DUPLICATION OF URETER WAS FOUND AND ONE OF THEM WAS OPENING IN VAGINA WHAT IS THE CAUSE= EARLY DIVISION OF URETERIC BUD

ALSO REMEMBER THESE MCQ'S

- Ureteric bud is formed as a part of = Mesonephric duct
- When ureteric bud fails to reach mesonephric cap= ureter without kidney
- Collecting system of kidneys derive from= ureteric bud
- Urothelium in following condition will have great chance to convert to carcinoma= Exstrophy of bladder
    - Exstrophy of bladder is the protrusion of the urinary bladder through a defect in the abdominal wall
- Child born mobile mass at lumbar region. Later he died and autopsy showed cystic swelling in lumbar region. Cause= Ureteric bud not meet to Metanephric duct
- Persistence of intra embryonic allantois will form= Urachal fistula
- A new born baby with extravasation of urine & malformed pubic= Exstrophy of bladder
- Meckel's diverticulum in young children is remnant of= Vitelline duct
- New born baby defect at umbilical region with defect in 3 layers of abdominal wall and intestines seen. Cause= Gastrochiasis
- In which congenital condition there are increased chances of urethral carcinoma= Bladder exstrophy

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514. AT WHICH WEEK DOPPLER CAN DETECT UMBILICAL ARTERY FLOW ON ULTRASOUND= 7TH WEEK

NOTE THIS

- ✓ Ref: Dewhurt's Obs Gynae box 2.6
- ✓ Umbilical artery doppler can be done as early 7-8 weeks
- ✓ 7-8-week visualization of blood flow in umbilical cord
- ✓ Week 14 → establishment of End Diastolic flow in umbilical arteries.
- ✓ Fetal start movement by 8 weeks 6th, 9th ??
- ✓ Fetal movements detected by mother at 20 weeks (Quickening)

CHAPTER # 19

UPPER LIMB

515 A PATIENT HAD ACCIDENT, FRACTURED SURGICAL NECK OF HUMERUS. MOST LIKELY INVOLVED NERVE IS= AXILLARY NERVE

REGARDING SHOULDER

- ❖ Anterior (Front) Dislocation of The Shoulder Joint→ most common type
- ❖ Nerve injured: Axillary nerve (can occur in both anterior as well as inferior, but more common in inferior dislocation)
- ❖ Vessels damage: posterior circumflex humeral artery (more common in anterior dislocation---its branch of axillary artery)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ Axillary nerve is most commonly damage in=Shoulder joint dislocation
- ❖ Fracture of the neck of humerus. Nerve likely to be injured= Axillary nerve
- ❖ After surgical neck of humerus fracture, there is loss of abduction and proximal upper arm lateral side sensation. Lesion in= Axillary nerve
- ❖ With fracture of shaft of the humerus, which of the following is likely to occur=Loss of sensation in lateral cutaneous arm
- ❖ A boy fell from a bike, and landed on his shoulder. He had his arm hanging by the side, and loss of innervation of lateral forearm. Which nerve is likely to be damaged= Nerve roots C5, C6
- ❖ Which nerves are involved in fracture of humerus=Axillary, radial, musculocutaneous
- ❖ Most common nerve injured in fracture of medial epicondyle of humerus is= Ulnar nerve
- ❖ Fracture to the surgical neck of humerus, most likely artery damaged is=Post Humeral Circumflex artery
- ❖ Anterior and posterior Humeral circumflex arteries are branches of=Axillary artery

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516. FRACTURE OF HAMATE CAN DAMAGE = ULNAR NERVE

ALSO NOTE THE FOLLOWING FRACTURES DAMAGES

- ✓ Midshaft of humerus ---------------------Radial N & profunda brachii A
- ✓ Surgical neck of humerus---------------Axillary N & posterior circumflex humeral A
- ✓ Medial epicondyle of humerus---------Ulnar N
- ✓ Hook of the hamate----------------------Ulnar N (outstreched hand)
- ✓ Neck of femur-----------------------Medial circumflex femoral Artery (avascular necrosis of head)
- ✓ Neck of fibula---------------------------------Common peroneal N
    - o Also remember Fracture of neck of fibula results in damage to =anterior tibial artery
- ✓ Fall asleep with arm over the back of chair------------Radial nerve
- ✓ Attempt to cut the wrist deep and below flexor retinaculum---------------Median nerve
- ✓ Attempt to cut the wrist structures damaged superficial to flexor retinaculum---Ulnar nerve and artery

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ A patient came with foot drop, lateral popliteal nerve is damaged. Most common site of fracture is= Neck of fibula
- ❖ Man Got gun injury lateral side of upper leg, He is unable to dorsiflex because of = Fracture neck of fibula
- ❖ Hard blow to the lateral side of right knee, Neck of fibula fractured. Artery damaged= Anterior Tibial
    - o Remember if asked which nerve damage then= common peroneal nerve

- Complication of fracture neck of femur is= Avascular necrosis
- In elderly female fracture of neck of femur occurred. Which is common delayed complication=Avascular necrosis
- Shaft of humerus fractured, the nerve likely to be injured are= Radial and axillary nerve
- Fracture of shaft humerus ARTERY injured= profunda brachii
- A Ball hit on anterior side thigh. Which vessel is damaged= Profunda femoral artery
- Pectoralis minor damaged due to= Fracture of coracoid process
- A 22yrs old woman is admitted to the hospital after falling from a tree. Radiographic examination reveals fractured hook of hamate bone. Which of the following nerves will most likely be injured=Ulnar

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517. X-RAY OF ELBOW OF 12 YR. GIRL, WHICH SECONDARY OSSIFICATION CENTER WILL APPEAR LAST ON X-RAY = LATERAL EPICONDYLE

- The order of appearances = the order of "I" and "T" are most important to remember; the trochlea ossification center should not appear before the internal (medial) epicondyle ossification center. If you can see a trochlea but no internal epicondyle, then you need to look very hard for the avulsed ossification center.

Order of Appearance	Capitellum	Radial Head	Internal Epicondyle	Trochlea	Olecranon	Lateral Epicondyle.
Age Estimation	1	3	5	7	9	11

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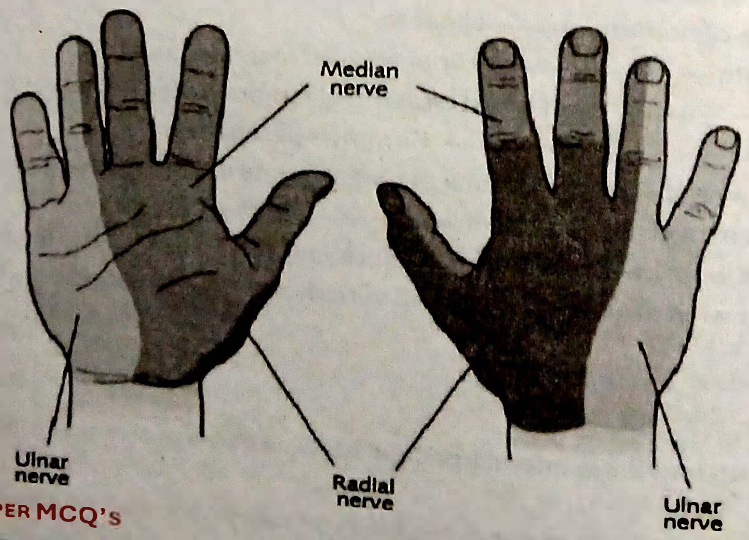
518. NOT SUPPLIED BY MEDIAN NERVE=ADDUCTOR POLLICIS

- MEDIAN NERVE SUPPLIES
    - **Muscular** (Mnemonic: LOAF)→ Lumbricals muscle (1st and 2nd), Opponens pollicis, Abductor and Flexor pollicis brevis.
    - **Cutaneous**→palmar aspect of lateral 3 and half fingers and distal half of dorsal aspect of each finger as well.
    - Also remember that carpal tunnel syndrome is due to compression of median nerve
    - Median nerve defect→ remember thenar wasting and loss of opposition of thumb
- ULNAR NERVE SUPPLIES
    - 3rd and 4th lumbricals and all interossei
    - Adductor pollicis
    - Short muscles of little finger (Abductor digiti minimi, Flexor digiti minimi, Opponens digiti minimi
    - Supplies skin over medial side of the back of hand.
    - Medial one and half fingers over proximal phalanges.



NOW LET'S DISCUSS SOME PAPER MCQ'S

RADIAL NERVE

- A patient is unable to extend his metacarpophalangeal joint, abduct and extend his thumb, sensation is intact, which nerve is damaged=Radial nerve (CPSP demo question Key—otherwise DEEP branch of Radial nerve was a better option)
  - It also comes as
    - A 15 years' male after injury to his left elbow region presented with inability to extend his metacarpopharyngeal joint of finger and can't abduct and extend the thumb but sensations are intact. Most likely injury to has occurred to=Radial nerve
- During its course in upper limb, the radial nerve lies=Spiral groove of humerus
- Patient had trauma to arm during game, now root of thumb is numb and can't open fist which nerve is damaged=Radial nerve
- Loss of sensation laterally on dorsum of hand due to injury to which of the following= Radial Nerve
- Injury in the region of anatomical snuff box resulted in severe bleeding. Most likely injury to which of the following=Radial artery

ULNAR NERVE

- Damage to medial epicondyle will most likely cause damage to which of the following muscle= Adductor Pollicis
- A boy falls down and fractures his medial epicondyle of humerus resulting in damage to ulnar nerve. Sensation in which area would be affected=Distal and palmer aspect of medial 1/3rd of hand
- Injury to ulnar nerve behind medial epicondyle causes=Loss of sensation in medial 1/3 of palmar and dorsal aspect.
- Sparing the lateral part of thenar eminence with conspicuous wasting of other small muscles of the hand suggest a lesion of=Ulnar nerve
- After an incised wound at front of wrist the pt was unable to perform adduction of thumb and abduction of little finger, sensation of the skin of palm were intact the most likely injured nerve is=Deep ulnar nerve

MEDIAN NERVE

- Thumb is adducted and laterally rotated. Which nerve is damaged=Median nerve
- Patient can't oppose thumb and little finger. Nerve damaged=Median nerve
- While taking blood sample at cubital fossa, which nerve is most likely to be injured=Median nerve
- After trauma, patient loses sensory sensations on the lateral palmar surface of the hand and unable to flex index finger. Lesion is in=Median nerve
- A patient comes with history of tingling sensations of the hand and inability to grip things properly. O/E there is wasting of thenar muscles. Which nerve is involved=Median nerve
- Long scenario about patient can't hold bottles mixed sensation at thumb, Loss of flexion at distal phalanx of thumb= Median nerve
- Regarding Carpel tunnel syndrome= Loss of thenar eminence
- One scenario of median nerve supply defect will result in hand= Carpel tunnel syndrome
- Carpal tunnel syndrome is due to compression of=Median nerve
- Wasting of thenar eminence, loss of sensation over thumb and index finger, nerve involved is = Median
- Patient presents with injury; the thumb is laterally rotated and adducted. Most likely nerve injured is= Median
- Median nerve damage above flexor retinaculum, thenar sensation also lost. What else is lost= Opposition of thumb
- Characteristic of Carpal tunnel syndrome= Sensory loss to lateral 3rd and half finger
- Carpel tunnel syndrome occurs in which of the following condition= Myxedema (hypothyroidism)

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519. 1ST AND 2ND LUMBRICALS ARE SUPPLIED BY =MEDIAN NERVE

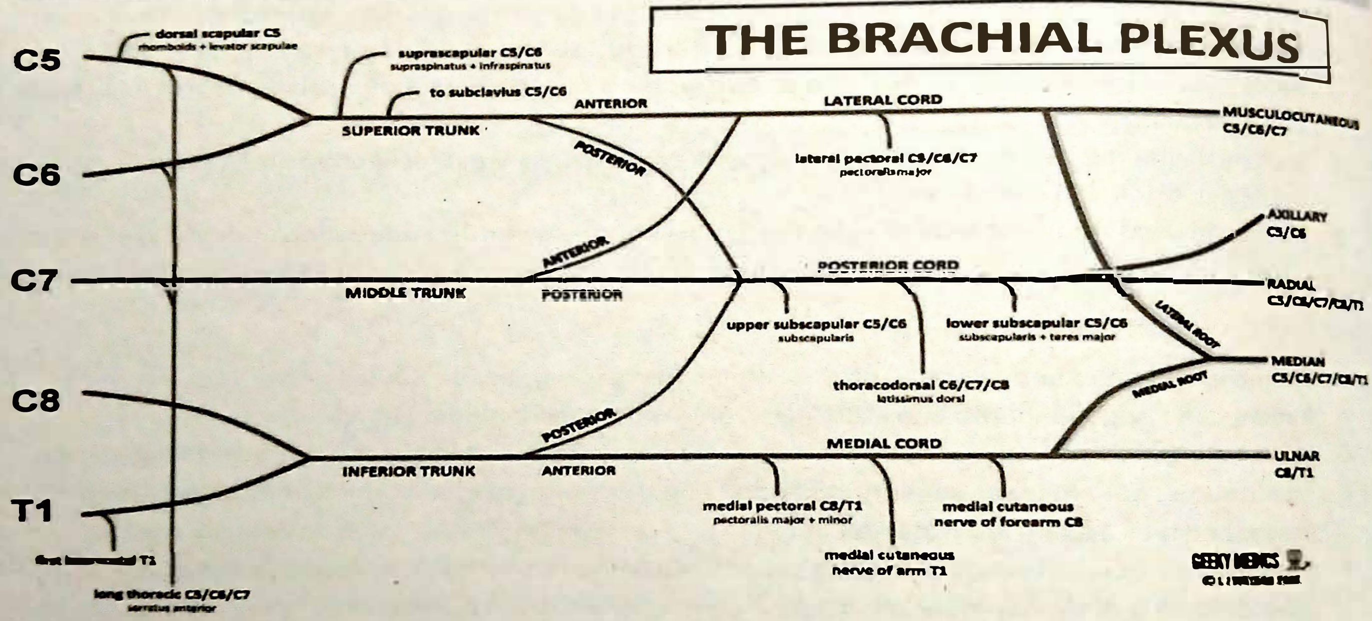
ALSO REMEMBER

- 3^{rd} and 4^{th} lumbricals and all interossei by →deep branch of ulnar nerve
- All the short muscles of hand are supplied by = T1
- Ulnar nerve lesion at the medial epicondyle will affect which muscles= Medial two lumbricals

520. **WHICH PART OF THE BRACHIAL PLEXUS HAS BRANCHES THAT SUPPLY THE EXTENSOR MUSCLES OF THE ARM=POSTERIOR CORD**

REMEMBER ABOUT BRACHIAL PLEXUS

Roots	❖ Anterior primary rami of spinal nerves C5, 6, 7, 8 and T1. o Prefixed plexus: contribution by c4 is large and T2 is often absent o Postfixed plexus: lacks C5 but has T2 contribution
Trunks	❖ Superior trunk: C5 and C6 ❖ Middle trunk: C7 ❖ Inferior trunk: C8 and T1. ❖ Divisions of trunk→ Each trunk divides into o Anterior or ventral division o Posterior or dorsal division
Cords	❖ Lateral cord: Union of anterior division of upper and middle trunk ❖ Medial cord: Anterior division of lower trunk ❖ Posterior cord: Union of posterior divisions of all three trunks.


THE BRACHIAL PLEXUS
C5
C6
C7
C8
T1
dorsal scapular C5
rhomboids + levator scapulae
suprascapular C5/C6
supraspinatus + infraspinatus
to subclavius C5/C6
ANTERIOR
SUPERIOR TRUNK
POSTERIOR
ANTERIOR
MIDDLE TRUNK
POSTERIOR
POSTERIOR
INFERIOR TRUNK
ANTERIOR
T1
long thoracic C5/C6/C7
serratus anterior
LATERAL CORD
lateral pectoral C5/C6/C7
pectoralis major
MUSCULOCUTANEOUS
C5/C6/C7
AXILLARY
C5/C6
POSTERIOR CORD
RADIAL
upper subscapular C5/C6
subscapularis
lower subscapular C5/C6
subscapularis + teres major
LATERAL ROOT
MEDIAN
C5/C6/C7/C8/T1
thoracodorsal C6/C7/C8
latissimus dorsi
MEDIAL ROOT
MEDIAL CORD
ULNAR
C8/T1
medial pectoral C8/T1
pectoralis major + minor
medial cutaneous
nerve of forearm C8
medial cutaneous
nerve of arm T1
GEEKY MEDICS

BRANCHES OF BRACHIAL PLEXUS

Branches of root	❖ Long thoracic nerve (C5,6,7- nerve to serratous anterior) ❖ Dorsal scapular nerve (c5- rhomboidus muscle)
Branches of trunk (Only from upper trunk)	❖ Suprascapular nerve (C5,6—supra and infraspinatous) ❖ Nerve to Subclavius (C5.6).
Branches of cords	❖ Lateral cord: (2LM) (C5,6,7) o Lateral pectoral nerve o Lateral root of median nerve o Musculocutanoeous nerve ❖ Medial cord: (4MU) (C8,T1) o Medial pectoral nerve. o Medial cutaneous nerve of arm o Medial cutaneous nerve of forearm o Medial root of median nerve o Ulnar nerve. ❖ Posterior cord: (2STAR) o Upper Subscapular (c5,6) o Lower Subscapular (c5,6)

- ○ Thoracodorsal nerve (c6, 7, 8- nerve to Latissimus dorsi).
- ○ Axillary nerve (c5,6)
- ○ Radial nerve (c5, 6, 7, 8, T1).

NOW LET'S DISCUSS SOME PAPER MCQ'S

Brachial Plexus: General Anatomy

- ❖ The following part of the brachial plexus is present in the axilla = Cords
- ❖ Which nerve arises from trunk of brachial plexus = Suprascapular nerve
- ❖ The only branch arising from the trunk of the brachial plexus is = Suprascapular nerve
- ❖ Which part/branch of the brachial plexus has a terminal branch that supplies the skin on the medial side of the arm = Medial cord
- ❖ The medial cord of the brachial plexus continues as the = Ulnar nerve
- ❖ Which of the following part of the brachial plexus has branches that supply the extensor muscles of the arm = Posterior cord
- ❖ Lateral cord of the brachial plexus supplies = Biceps Brachii

BRACHIAL PLEXUS: INJURIES AND CLINICAL CASES

- ❖ Upper brachial trunk injury involves = Ventral rami of C5, C6
- ❖ Damage of upper brachial plexus causes = Violent separation of neck and shoulder
- ❖ A 2-year-old child has got his left arm in medial rotation. The lesion is most likely at the level of = Upper trunk of the brachial plexus
- ❖ A lesion of the upper trunk of the brachial plexus will cause the following effects EXCEPT = Supination of the forearm
- ❖ Loss of adduction of the arm, flexion at the elbow, and extension at the wrist indicates damage to the = Upper part of the brachial plexus
- ❖ A 2-year-old child with medial rotation and elbow extension likely has a lesion at = Upper trunk of the brachial plexus
- ❖ The muscle most adversely affected by lower trunk injury of the brachial plexus is = Opponens pollicis
- ❖ Muscle most affected by lower trunk brachial plexus injury = Opponens pollicis
- ❖ A lesion of the lateral cord of the brachial plexus leads to paralysis of = Pectoralis minor
- ❖ A patient presented in ER following RTA with damage to the lateral cord of the brachial plexus. Which of the following muscles will be affected = Pectoralis major
- ❖ During brachial plexus block by axillary approach, the lateral part of the forearm was still having sensation. The nerve which was spared from anesthetic effect is = Musculocutaneous nerve
- ❖ In an axillary injury involving C8-T1 of the brachial plexus, the muscle spared is = Flexor carpi radialis

NERVE AND MUSCLE INVOLVEMENT

- ❖ Brachial plexus block. Patient still feels pain on the lateral aspect of the forearm. Which nerve is spared = Musculocutaneous nerve
- ❖ The medial cord of the brachial plexus continues as the = Ulnar nerve

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521. THUMB IS ADDUCTED AND LATERALLY ROTATED. WHICH NERVE IS DAMAGED= MEDIAN

REMEMBER THESE IMPORTANT POINTS ABOUT BRACHIAL PLEXUS INJURIES

Injury to Upper Trunk	❖ Upper trunk→Erb's paralysis. ❖ Deformity: ○ Arm hangs by the side ○ It is adducted and medially rotated, extended and pronated (waiters tip hand).
Injury to Lower Trunk	❖ Lower trunk → klumpke's paralysis. ❖ Deformity:

	o Claw hand, o Horner's syndrome
Injury of Long Thoracic Nerve	❖ It is Nerve to serratous anterior: ❖ Deformity: o Winging of scapula ❖ Results in: o Loss of pushing and punching action. o Arm cannot be raised above 90 degree. That is over head.
Injury of Radial Nerve	❖ Causes: o Fracture of midshaft of humerus (spiral groove) ❖ Deformity: o Wrist drops o Unable to extend wrist and fingers
Injury to Median Nerve	❖ Control coarse movement of hand therefore called labourers nerve. ❖ Ape thumb deformity: o Due to paralysis of thenar muscles o Thumb adducted and laterally rotated. o Opposition of thumb completely lost. o Unable to pick up a pen with thumb and index finger.
Injury to Ulnar Nerve	❖ Called musicians nerve because control fine movements of fingers. ❖ Deformity: o Claw hand o Flexion of terminal phalanges of ring and little finger is lost.
Mnemonic DR. CUMA	❖ Drop wrist ---------- Radial nerve ❖ Clawhand ----------- Ulnar nerve ❖ Median nerve ------ Ape hand
Other points to remember	❖ Musculocutaneous nerve injury o Weak flexion at elbow and supination

RADIAL NERVE

- Nerve involved in causing Wrist drop=Radial nerve
- Bullet injury at radial groove of humerus. Results in= Loss of extension of wrist with wrist drop
- Lesion at radial groove on humerus causes= Wrist drop
- Spiral groove injury leads to wrist drop. Damage to= Radial nerve
- Which nerve accompany radial artery in radial grove at shaft of humerus= Deep Radial nerve

ULNAR NERVE

- Loss of sensation on medial side of hand and claw of two medial fingers in distal interphalangeal joint which nerve is damaged= Ulnar nerve
- Most common nerve injured in fracture of medial epicondyle of humerus is= Ulnar nerve
- 20 years' boy presents with medial epicondyle fracture. Damage to which nerve is most likely to happen= Ulnar

MEDIAN NERVE

- Patient can't oppose thumb and little finger. Nerve damaged= Median nerve
- Hypothyroid lady has loss of sensations in index and middle fingers. What other feature is related= Loss of opposition of thumb

OTHERS

- Weak flexion and supination at elbow after axillary trauma. Nerve involved= Musculocutaneous
- On mastectomy patient had winging scapula. Which nerve is damaged= Long thoracic

- Circumduction is a combination of= Adduction, Abduction, Flexion, Extension
- Pt had an axillary injury after which there was loss of flexion at elbow and supination. Nerve damaged is=Musculocutaneous
- A 32-year-old construction worker arrives in the emergency department after an accident on the job. The tendon of the biceps brachii at the elbow has been severed by a laceration that extends 2 cm medially from the tendon. Which of the following structures is likely to have been injured by medial extension of the laceration=Brachial artery
    - Also note that
        - The two veins running parallel with brachial artery in the arm are= Vena comitantes
- Innervation of Deltoid Muscle=Axillary nerve
- Patient had RTA. His Right upper limb is hanging and there is loss of skin sensation on lateral side of arm=Axillary nerve
- Damage of upper brachial plexus causes=Violent separation of neck and shoulder
- A two-year girl presents in OPD with Hx of forceps delivery. O/E she is unable to abduct left shoulder, loss of active flexion of left elbow and inability to supinate left arm. Most probably injury is to= Upper brachial plexus

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22. A GIRL IS UNABLE TO COMB HER HAIRS, NERVE INJURED= SPINAL PART OF ACCESSORY NERVE

REMEMBER ABOUT ARM ABDUCTION

Range of movements	Muscle	Nerve
Upto 15°	Supraspinatus	Suprascapular
15-90°	Deltoid	Axillary
Beyond 90°	Serratous anterior	Long thoracic
	Trapezius	Accessory (spinal part mostly)

Points to remember:

- ✓ Trapezius and serratus anterior (are both use for abduction beyond 90 degrees) ---so if person can't comb his hairs or can't move his hand above 90 degrees---any of these could have been damaged---- remember role of Serratous anterior > trapezius
- ✓ Localize the point of trauma like for example if neck trauma or surgery is mentioned---prefer trapezius and its nerve then---- same goes for Serratous and its nerve if breast surgery or chest tube placement mentioned prefer that

NOW LET'S DISCUSS SOME PAPER MCQ'S

- A girl is unable to comb her hairs, Nerve injured= long thoracic nerve
- Patient can't scratch his back muscle damaged= latissimus dorsi
- A person has injury to spinal accessory never he cannot abduct the arm above 90 degrees because= Scapula cannot move forward
- Pt. cannot rotate scapula forward which muscle is damaged= Serratus anterior
- Winged scapula caused by paralysis of which muscle= Serratus anterior
- A person is asked to bring down his fully abducted arm slowly but when he tries his arm falls suddenly. Which muscle is diseased= Supraspinatus (Drop test)
- A man has difficulty is shrugging his shoulders. Most likely the nerve damaged is=Accessory nerve
- A boy had a fall on outstretched hand after which he can't abduct his hand. After initial assessment, he can't abduct till 30 degrees after which abduction is smooth. Lesion in which muscle=Supraspinatus
- A nerve is injured in neck region and there is weakness in raising arm above the head. The nerve injured is=Spinal accessory nerve
- Muscle responsible for rotation of scapula=Serratus anterior

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LATISSIMUS DORSI MUSCLE SUPPLIED BY WHICH NERVE= THORACODORSAL NERVE

[illegible]

Muscle	Nerve Supply
Trapezius	❖ Motor → Spinal part of accessory nerve ❖ Sensory → C3 and C4
Latissimus dorsi	❖ Thoracodorsal nerve
Levator scapulae	❖ C3 and C4 nerve ❖ Dorsal scapular nerve (C5)
Rhomboid minor and major	❖ Dorsal scapular nerve
Serratus Anterior (Mnemonic: SALT)	❖ Long Thoracic nerve
Deltoid	❖ Axillary nerve
Extensor carpi ulnaris	❖ Posterior interosseous nerve

Now let's discuss some paper MCQ's

- Latissimus dorsi muscle supplied by which nerve= Thoracodorsal nerve
- Dorsal scapular nerve damaged. Muscle involved= Rhomboid major
- Levator scapulae is supplied by= C3, C4 nerve (If C3-C5 in options prefer that)
- Extensor carpi ulnaris supplied by= Posterior interosseous nerve

Other important points:

- Can't scratch the back, muscle damaged is= latissimus dorsi, supplied by thoracodorsal nerve.
- Can't comb the hair, muscle damaged is= Serratus anterior, supplied by long thoracic nerve

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524. LACERATION OF WRIST. WHICH STRUCTURES ARE LIKELY TO BE INJURED= ULNAR NERVE AND ULNAR ARTERY

REMEMBER STRUCTURES ABOVE AND BELOW FLEXOR RETINACULUM

Structures passing superficial to the flexor retinaculum	Structures passing deep to the flexor retinaculum (Mnemonic--Medical Superintendent is FuLLy Boring)
❖ Tendon of palmaris longus. ❖ Palmar cutaneous branch of median nerve and ulnar nerve ❖ Ulnar vessels and ulnar nerve.	❖ Median nerve ❖ Tendons of flexor digitorum Superficialis. ❖ Tendon of Flexor poLLicis longus. ❖ Bursa → Ulnar and radial

Now let's discuss some paper MCQ's

- Structure passing above flexor retinaculum= Ulnar nerve and artery
- A girl after fight with her best friend, was unable to extend her all fingers. She also noted that she can't abduct her thumb too, nerve injured is= Radial nerve injury
- Structures passing superior to transverse carpal ligament are=Ulnar nerve

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525. DEEP PALMAR ARCH IS FORMED BY= RADIAL ARTERY

NOTE THAT

- Deep palmar arch (deep volar arch) → formed mainly from the terminal part of the radial artery
- Superficial palmar arch, is formed predominantly by the ulnar artery.

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526. WOMEN HAVING WHIPLASH INJURY DURING RTA. DAMAGED C5 AND C6 NERVES. SHE WILL BE HAVING WHICH OF THE FOLLOWING DISABILITY= FLEXION OF ELBOW

Few MCQs about muscle, nerve and their role

- Wrist adduction is done by= Flexor and extensor carpi ulnaris
- Circumduction definition= Combination of abduction, adduction, flexion and extension

- Atlantoaxial joint movement= Rotation
- After an incised wound at front of wrist the pt was unable to perform adduction of thumb and abduction of little finger, sensation of the skin of palm were intact the most likely injured nerve is= Deep ulnar nerve
- A patient is unable to extend his metacarpophalangeal joint, abduct and extend his thumb, sensation is intact, which nerve is damaged= Radial nerve
- Thumb is adducted and laterally rotated. Which nerve is damaged= Median nerve
- In Carpal tunnel syndrome, which movement of thumb is affected= Opposition

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527. LONG THORACIC NERVE SUPPLIES = SERRATUS ANTERIOR

REMEMBER THE NERVE SUPPLY OF THE FOLLOWING –ONLY THOSE THAT HAVE CAME IN PREVIOUS CPSP PAPERS SO FAR---IN CPSP WORDS

Name	Nerve
Geniohyoid	❖ C1
Platysma	❖ Cervical branch of facial nerve
Posterior belly of digastric	❖ Facial nerve
Masseter muscle	❖ Mandibular branch of trigeminal
Submandibular gland	❖ Parasympathetic part of facial nerve
Plantar surface of foot	❖ Post tibial nerve
Sternocleidomastoid muscle	❖ Spinal accessory nerve
Rectus abdominis	❖ Lower 6 thoracic nerve Or sometimes an option is given as ❖ Last five intercostal and subcostal nerve
Detrusor	❖ Parasympathetic pelvic nerves (Inferior hypogastric plexus)
vulva	❖ Pudendal nerve
Levator scapulae	❖ Dorsal scapular nerve
Rectus Capitis Posterior	❖ Occipital nerve
Suprarenal Gland	❖ Greater splanchnic nerve (or also sometimes given option as Preganglionic greater splanchnic nerve
Dura of Middle Cranial Fossa	❖ Trigeminal nerve
Posterior 1/3 of the Tongue	❖ Glossopharyngeal nerve
Gluteus Medius	❖ Superior gluteal nerve
Sternothyroid	❖ Ansa cervicalis
Scrotum	❖ Ilioinguinal
Back Muscle	❖ Dorsal Rami of posterior spinal nerve
Cremasteric	❖ Genital branch of Genitofemoral
Internal Anal Sphincter	❖ Hypogastric plexuses.

SOME OTHER MCQS RELATED TO NERVE SUPPLY OR VALUE

- Nerve supplying area below orbit above mouth= maxillary division of trigeminal
- Sympathetic supply of lower airways is from=T3-T4
- Nerve supply of ant. Abd wall=T7-L1
- In Hirsch sprung disease, there is complete absence of ganglion cells. these ganglia receive fibres from which segment of spine=S2 S3 S4
- A 4-day old newborn with distended abdomen and vomiting was diagnosed as Hirschsprung's disease in which there is complete absence of parasympathetic ganglia in sigmoid colon. These ganglion cells receive preganglionic fibers from which segment of spinal cord=S2, 3, 4
- Autonomic nerve innervation of midgut is at the level of=T8-T12

LOWER LIMB

528. LIGAMENT THAT PREVENTS ANTERIOR DISLOCATION OF FEMUR ON TIBIA = POSTERIOR CRUCIATE

529. ANTERIOR CRUCIATE LIGAMENT IS DAMAGED DIRECTION OF TIBIAL DISLOCATION ON FEMUR IS= ANTERIOR

FOR ABOVE MCQ'S REMEMBER THE MNEMONIC

- ❖ ABL→Anterior cruciate ligament prevents Backwards sliding of the femur on the tibia and inserts Laterally
- ❖ PFM→Posterior cruciate ligament prevents Forwards sliding of the femur on the tibia and inserts Medially

ALSO REMEMBER IT AS:

- ❖ Anterior dislocation of tibia on femur is prevented by→anterior cruciate ligament
- ❖ Anterior dislocation of femur on tibia is prevented by→Posterior cruciate ligament.

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ Isolated complete rupture of anterior cruciate ligament will cause instability of tibia on femur. The direction of instability will be in= Anterior
- ❖ Anterior disability of tibia on femur caused by= Anterior cruciate ligament
- ❖ In anterior cruciate ligament injury. Tibia and lateral condyle of femur will move= Anterolateral
- ❖ Which ligament protects anterior dislocation of femur over tibia= Posterior cruciate
- ❖ True about cruciate ligaments= Inside capsule
- ❖ With damage to anterior cruciate ligament will result in instability of tibia over femur. The direction of instability will be= Anterior
- ❖ Footballer hit on lateral side of knee in extension. Most likely ligament damaged is= Tibial collateral
- ❖ Excessive movement of tibia in anterior direction will lead to injury of= Anterior cruciate ligament
- ❖ Cruciate ligament of knee joint is= Intracapsular

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530. ADDUCTOR CANAL IS FORMED BY = VASTUS MEDIALIS AND ADDUCTOR MUSCLE

- ✓ Boundaries are
    - o Anteriorly - sartorius.
    - o Poster medially - adductor longus and adductor magnus.
    - o Laterally - Vastus medialis
- ✓ Contents:
    - o Canal contains the superficial femoral artery, femoral vein, and branches of the femoral nerve (specifically, the saphenous nerve, and the nerve to the vastus medialis)

SOME PAPER MCQ'S RELATED TO CANALS AND FEW OTHER REPEATED MCQ'S

- ❖ Innervation to birth canal is by= Inferior hypogastric plexus > Pudendal nerve
- ❖ Pus in adductor canal can affect which neighboring structure= femoral vein
- ❖ Structure most likely to be affected by pus in adductor canal is=Femoral vein
- ❖ Regarding adductor canal true is= The anteromedial wall Is formed by Sartorius muscle and fascia
- ❖ A 5 years old child presented with unilateral cryptorchidism and testis is present outside scrotum within inguinal canal. Which of the following is more likely to occur in this child= Malignancy
- ❖ Adductor canal= Present in hamstring

- Regarding anal canal which is true= supplied by both superior & inferior rectal artery
- Regarding Volkmann’s canal= Vascular space
- Regarding femoral canal= Allow femoral vein to distend during increases venous return
- Femoral vein is related laterally to= Femoral artery
- Femoral artery is pulsated at=Mid-inguinal point

531. NECK OF FEMUR SUPPLIED BY = MEDIAL AND LATERAL CIRCUMFLEX ARTERIES

- **Femur:**
    - Blood supply of head of femur
    - Adults (Retinacular artery > medial circumflex artery)
    - Child (obturator artery)
    - Blood supply of neck of femur--Medial and lateral circumflex artery
- **Humerus:**
    - Blood supply of head of humerus--- (Arcuate > Anterior humeral circumflex)
    - Blood supply of neck of humerus --Anterior and posterior circumflex

NOW LET’S PRACTICE SOME PAPER MCQ’S

- In adult’s head of femur supplied by= Retinacular artery
- Avascular necrosis of femoral head is likely due to damage to which artery= Medial circumflex artery
- Main supply of head Humerus= Arcuate

532. MAIN PILLAR OF MEDIAL LONGITUDINAL ARCH OF THE FOOT POSTERIORLY BY= CALCANEUM

NOTE THIS AS MOST OF THE STUDENTS ARE CONFUSED IN THIS

Medial Longitudinal Arch	Formed by Calcaneum, talus, Navicular bone, 3 cuneiform bones, and first 3 metatarsal bones. Anterior Pillar: Medial 3 metatarsal bones Posterior Pillar: Calcaneum Key stone: Talus
Lateral Longitudinal Arch	Formed by Calcaneum, cuboid, and 4th 5th metatarsal bones Anterior Pillar: 4th and 5th metatarsal bones Posterior Pillar: Calcaneum Key stone: Cuboid
Transverse Arch	Formed by bases of metatarsal bones, cuboid, 3 cuneiform bones

REMEMBER IT COMES IN CPSP AS

- Main support ligament of medial longitudinal arch= calcaneo-navicular ligament
- Main pillar of medial longitudinal arch of the foot posteriorly by= Calcaneum
- Posterior pillar of lateral longitudinal arch= Calcaneum
- Main pillar of lateral longitudinal arch= Calcaneum
- Main Pillar/Key stone of medial longitudinal = Talus
- If asked main supporting bone= Calcaneum
- Posterior pillar of lateral longitudinal arch= Calcaneum
- Which of the following bone has no muscle attachment= Talus
- Injury to Talus cause flat sole it is likely damage to= Medial longitudinal arch
- Main pillar of medial longitudinal arch of foot is= Talus
- One of the following bones does NOT articulate with the navicular= Calcaneus

533. EVERSION IS DONE BY = PERONEUS LONGUS

NOTE THE KEY WORD

- ✓ In inversion and Eversion always apply 2nd letter rule, such as
  - Inversion by= tIbialis anterior, tIbialis posterior
  - Eversion of leg=pEroneus Longus, pEroneus Brevis, pEroneus Tertius

ALSO REMEMBER

- ✓ Dorsiflexion (toes pointing upward) and plantar flexion (toes pointing downward)
- ✓ Inversion and eversion take place at the tarsal joints and not at the ankle joint.
- ✓ Note that → Dorsiflexion is performed by the tibialis anterior, extensor hallucis longus, extensor digitorum longus, and **peroneus tertius**
- ✓ if asked loss of Eversion and as well as Dorsiflexion= always click Peroneus Tertius

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ Muscle involved in eversion of foot= Peroneus longus
- ❖ PT lost eversion of foot, muscle paralyzed= Peroneus longus
- ❖ A young runner has difficulty in dorsiflexion and Eversion of right foot. Which of the following muscle is likely paralyzed= Peroneus Tertius
- ❖ Muscle which causes dorsiflexion of the foot at the ankle joint is= Tibialis anterior
- ❖ Patient had loss of Inversion at foot= Tibialis anterior and tibialis posterior
- ❖ Loss of inversion of foot but able to Evert. Muscles damaged are=Tibialis anterior and Tibialis posterior
- ❖ Loss of inversion of foot. Which of the following muscles have been damaged= Tibialis anterior and Tibialis posterior
- ❖ Inversion and eversion of foot at which joint= Subtalar joint
- ❖ Extensive eversion can damage to= Deltoid ligament
- ❖ Which Ligament when damaged due to extreme inversion of the foot cause sprain= Calcaneofibular
- ❖ Regarding fracture and torsion of deltoid, mechanism of injury=Eversion
- ❖ Pt can't move sole of foot medially. Which group of muscle are involved=Tibialis anterior and Tibialis posterior muscle weakness
- ❖ Muscle which causes dorsiflexion of the foot at the ankle joint is=Tibialis anterior

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534.

COMMON PERONEAL NERVE DAMAGE WHICH ACTION IS AFFECTED= EVERSION

REMEMBER THIS VIA MNEMONIC

Common peroneal nerve	❖ PED =Peroneal Everts and Dorsiflexes ❖ If injured, results in foot Dropped
Tibial nerve	❖ TIP =Tibial Inverts and Plantarflexes ❖ If injured, can't →Stand on TIP of Toes

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ Dorsiflexion and eversion of foot is due to involvement of=Common peroneal
- ❖ Loss of eversion and dorsiflexion at foot which nerve injured= Common peroneal nerve
- ❖ Common peroneal nerve damaged. What will occur= Eversion lost
- ❖ A pt with Hx of RTA. Presented with fracture fibula neck and foot drop. O/E there is loss of dorsiflexion and loss of sensation over dorsum of the foot. Nerve damaged is=Common peroneal nerve
- ❖ A 15-year-old boy is brought to the emergency after a fall from his bike. X-ray reveals fracture of head of fibula. On physical examination the patient has a foot drop. Which of the following nerves is most likely injured= Common Peroneal
- ❖ A pt with Hx of RTA. Presented with fracture fibula neck and foot drop. O/E there is loss of dorsiflexion and loss of sensation over dorsum of the foot. Nerve damaged is= Common peroneal nerve
- ❖ A footballer had injury in left foot, his foot was everted and on examination found that he has lateral malleolar fracture, what other findings should be present in this case= Loss of dorsal sensation of foot
- ❖ If a foot is permanently dorsiflexed and everted. Which nerve is most likely damaged=Tibial nerve

536. **A 25YEAR OLD SPRINTER DEVELOPED ACUTE LEG PAIN WHILE RUNNING. THE NEXT DAY HE NOTICED ECCHYMOSIS AROUND ANKLE. HE CAN STAND ON HIS TOES THROUGH IT HURTS. THE MOST LIKELY CAUSE IS= RUPTURED PLANTARIS TENDON**

KNOW THE DIFFERENCE BETWEEN TWO

Plantaris and Achilles	❖ Can stand on toes but painful =plantaris tendon rupture ❖ Can't stand on toes= Achilles rupture

ALSO NOTE THIS

- ✓ Pain in left calf on walking and relieved by rest. Involves which of the following=Popliteal artery

537. **ANTERIOR INFERIOR ILIAC SPINE FRACTURE, PELVIC AVULSION IS DONE BY WHICH MUSCLE= RECTUS FEMORIS**

NOTE THE DIFFERENCE

- ✓ In Anterior superior iliac spine fracture, pelvic avulsion is done by which muscle = Sartorius
- ✓ Avulsion of lesser trochanter, muscle damaged=Psoas major

538. **AFTER RTA UNABLE TO FLEX BOTH HER LEG AND THIGH=SARTORIUS**

NOTE THE FOLLOWING

- ✓ **Quadriceps Femoris (Muscles of Anterior Compartment of Thigh) –**
  - o Includes 4 muscles Rectus femoris, Vastus lateralis, Vastus medialis, Vastus intermedius
- ✓ **Hamstring muscles (Muscle of Back of Thigh) includes–**
  - o Biceps femoris, Semitendinosus, Semimembranosus
  - o Bicep femoris has two heads and dual nerve supply
    - ▪ Long head: tibial portion of sciatic nerve
    - ▪ Short head: common peroneal portion of sciatic nerve

NOW REMEMBER THESE IMPORTANT CONFUSING POINTS

- ✓ Muscle which EXTEND the THIGH and FLEX the LEG= Hamstring muscle (i. e Semitendinous, Semimembranous, biceps femoris)
- ✓ Muscle which FLEX the THIGH and EXTEND the LEG= Rectus femoris
- ✓ Muscle which FLEX both KNEE and THIGH= Sartorius

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ ~~Which muscle is flexor at hip and extensor at knee= Rectus femoris~~
- ❖ After a lesion of the tibial part of the sciatic nerve, some active flexion may still be possible at the knee joint, the most likely muscle responsible for this remaining flexion is= The short head of the biceps femoris muscle
- ❖ A girl fell down and got injured, after which she is unable to flex her thigh and leg. Muscle involved is= Sartorius
- ❖ Which of the following is a muscle extending from femur having role in stability of knee joint= Vastus lateralis
- ❖ A person has knee Instability after trauma. Which of the following muscles is paralyzed= Vastus lateralis
- ❖ Patient complains of loss of extension and lateral rotation of the thigh. Muscle involved is= Gluteus maximus
- ❖ A young athlete has difficulty in flexion of knee and hip. Which of the following muscles is likely paralyzed=Sartorius

ALSO REMEMBER

- ❖ The muscle that traverses shoulder joint capsule is=Long head of biceps

539. **PATIENT HAD A HIP FRACTURE. AFTER [illegible] RIGHT HIP SINKS DO[illegible] WHICH LEVEL= LEFT GLUTEUS MEDIUS**

Superior gluteal nerve	❖ Common cause: intra-gluteal injections ❖ Results in paralysis of →gluteus medius and minimus ❖ Trendelenburg's test: ○ Normally when the body weight is supported on one limb, the glutei of the supported side raise the opposite unsupported side of pelvis. ○ However, if abductor mechanism is defective, the unsupported side of pelvis drops, this is known as a positive Trendelenburg's test. ○ It is caused by paralysis of gluteus medius, dislocation of hip joint, or fracture of neck of femur. ○ Patient cannot walk normally. ○ Sways (waddles) on paralyzed side to clear the opposite foot of the ground. This is known as lurching gate; when bilateral it is called waddling gate. ○ Unilateral positive Trendelenburg's sign produces a lurching gait ○ Bilaterally positive Trendelenburg's sign produces a waddling gait.
Inferior gluteal nerve	❖ Paralysis of → Gluteus Maximus ❖ Patient cannot stand from sitting position without support, Difficulty climbing stairs, loss of Hip extension

NOW LET'S PRACTICE SOME PAPER MCQ's

- ❖ ~~Female unable to stand from sitting position, normal gait. Which muscle is paralyzed= Gluteus~~ maximus
- ❖ Sinking of RT side of pelvis on elevation of contralateral foot during walking. What is the cause= Left gluteus medius paralysis
- ❖ Pt unable to stand from sitting position due to damage to= Gluteus maximus
- ❖ A patient has difficulty in walking when his left leg is still in air the pelvis sinks towards the right side. This is due to= Left sided gluteus medius and minimus
- ❖ Superior to piriformis what is injured= Superior gluteal artery
- ❖ If one leg is raised in air which muscle stablizes pelvis= gluteus medius
- ❖ Hip joint is related to= obturator externus Inferiorly
- ❖ Injection intra gluteal in given with technique to avoid damage to= Superior gluteal nerve Reference first aid edition 2017 page 431
- ❖ Multiple bone fracture, BP: 70/50,1st step in management= Volume replacement

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40. THE MUSCLE INVOLVED IN UNLOCKING OF KNEE JOINT IS = POPLITEUS

- ❖ While Locking is produced by continued action of the same muscles that produce extension i.e. Quadriceps femoris
- ❖ Also note that when Patellar tendon tapped what will happen =Quadriceps femoris will contract

OW A PAPER MCQ

- ❖ The process of unlocking the fully extended knee in preparation for flexion requires initial contraction of which of the following= Popliteus muscle

LSO NOTE THIS MCQ

- ❖ Which of following is an intra-articular tendon=Popliteus

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MOST COMMONLY FRACTURE OF BONE AFTER 60 YRS. = NECK OF FEMUR

MEMBER

- ❖ Most common fractured long bone - Tibia.
- ❖ Most common fractured bone in upper limb= clavicle

- Most commonly fractured carpal bone in hand= Scaphoid
- Most commonly dislocated carpal bone= Lunate
- Most common point of rib fracture= angle of rib
- If foot size decrease after fracture= Femur neck fracture
- Limb growth will be affected if fracture passes through=Epiphyseal plate
- If First rib in MCQ= look for Subclavian

NOW LET'S PRACTICE SOME PAPER MCQ'S

MOST COMMON

- Most common type of fracture in people above 60 years= Fracture of femur neck
- Most common long bone fracture= Tibia
- Most common fracture of clavicle= lateral 1/3
- First rib fracture causes damage to= subclavian artery
- A player presented to ER with weak pulses in his right hand and fracture of right first rib after a game. Which of the following arteries will be damaged= Subclavian (Clue--- First rib)
- Most commonly fractured bone in hand= Scaphoid
- Most common fractured bone of the wrist= Scaphoid

RIBS

- Most common site of rib fracture is=Angle
- Common site of Rib fracture=Just anterior to angle of ribs
- Child with fractures 5th and 6th rib. Which anaesthesia will be needed for long pain relief= Bupivacaine
- The weakest point from where a rib can be fractured is the= Angle

ILIUM, ISCHIUM AND PUBIS

- Fracture of acetabulum superior-lateral, which bone fracture occur= Ilium and ischium
- A boy had trauma to pelvis and his acetabulum moved in postero-superior direction. Which of the 2 bones are fractured= Ischium and Ilium
- Lower part of floor of acetabulum is fractured which bones are involved= Pubic bone and ischium

FEMUR

- A 30-year female presented to ER after an accident with short left leg rotated laterally. Cause is=Femur neck fracture
- 50-year-old male with Hx of fall but no loss of consciousness now one limb looks shorter than the other and is laterally rotated. Diagnosis= Neck of femur fracture

EPIPHYSEAL

- Limb growth will be affected if fracture passes through=Epiphyseal plate
- Remnant of Epiphyseal plate is= Epiphyseal line

OTHER

- A patient with compound fracture of femur and laceration on thigh region. His bone was fixed and skin was sutured. After few days wound was healing well but still some serosanguinous fluid was oozing from suture site. Cause is=Foreign body
- Clavicle fracture at outer 1/3 & inner 2/3. Inner clavicle elevated by which muscle= Sternocleidomastoid
- A player has suffered fracture of right first rib. O/E radial pulse was feeble. Which of the following arteries will be damaged= Subclavian

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542. THE MOST FREQUENTLY FRACTURED CARPAL BONE IN THE HAND IS THE= SCAPHOID

NOTE THESE FEW MCQ'S ABOUT BONES IN HAND

- Medial attachment of flexor retinaculum on ulnar side= Pisiform

- ❖ A patient after fall on outstretched hand with trauma on wrist develops dislocation of lower portion of joint posteriorly & medially. Most probably he has= Colle's fracture
- ❖ At wrist joint, which bone articulates with radius= Scaphoid
- ❖ Middle carpal bone in proximal row= lunate

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543. 5TH METACARPAL BONE FRACTURE, TYPE= BOXER'S FRACTURE

NOTE THESE COMMONLY ASKED FRACTURES

- ➤ BOXERS --- Neck of fifth metacarpal
- ➤ Bennett's ----- (Intra-articular) Base of 1st metacarpal
- ➤ Rolando's ---- (Extra-articular) Base of 1st metacarpal
- ➤ Chauffer's ---- Radius above styloid process
- ➤ Jones ---------- Base of 5th metatarsal
- ➤ Hangman's -- Axis
- ➤ Smith's -------- Reverse of colles fracture

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544. FEMALE PRESENTS WITH ARTERIAL DISEASE. O/E PULSATILE MASS IN ABDOMEN IS NOTED. SITE OF ORIGIN IS=L1 – L3

REMEMBER

- ❖ Pulsating mass in abdomen of an 80-year-old lady. Most common location= L1-L3
- ❖ Visible, Intercostal pulsations notching of ribs on XRAY. Cause= Post ductal Coarctation of aorta.

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545. PUDENDAL NERVE ROOT VALUE= S2, S3, S4

REMEMBER THE FOLLOWING ROOT VALUES

Nerve	Root value	
Greater Auricular Nerve	C2-C3	Supplies skin over angle of jaw and over parotid gland
Phrenic nerve	C3, C4, C5	Diaphragm
Long thoracic nerve	C5,6,7	nerve to serratus anterior
Musculocutaneous nerve	C5,6,7	
Ulnar nerve.	C8, T1	
Thoracodorsal nerve	C6, 7, 8	Nerve to Latissimus dorsi
Axillary nerve	C5,6	Supplies deltoid
Radial nerve	C5, 6, 7, 8, T1	
Obturator	L2, L3, L4	
Femoral	L2, L3, L4	
Pudendal nerve	S2, S3, S4	Supplies pelvic diaphragm, perineum and other struct
Supply of midgut	T8-T12	

NOW LET'S SOLVE SOME PAPER MCQ'S

S2, S3, S4

- ❖ Pudendal Nerve root value= S2, S3, S4
- ❖ Lady fell from second story. After which she can't void and complains of dribbling of urine. Spinal cord damage at the level of= S2, 3, 4
- ❖ Urinary incontinence. Lesion at= S2, S3, S4

- A child fell from 7 feet height. Later he develops urinary incontinence and loss of control over bowel. The lesion is in = S2, 3, 4
    - It also comes as
        - A 45-year-old man fell on his back from the 2nd story of a building. Two days after being admitted to the hospital, he complained of the inability to void urine and urinary incontinence. The most likely spinal segment involved is = S2, 3, 4
- Parasympathetic supply was asked of rectum= S2, S3, S4
- Fecal incontinence nerve damaged, root value= S2, S3, S4
- S2, 3, 4 nerves are against which vertebrae=L1-L2
- In a female, obstetric nerve block was given causing urinary incontinence in her. The most probable cause is paralysis of = Urogenital diaphragm
- To anesthetize the perineum during delivery, a pudendal nerve block is performed. This nerve block may result in urinary incontinence due to anesthesia of muscle lying in the = Urogenital diaphragm

L2, L3, L4

- Femoral Nerve root valve= L2, 3, 4
- Pt after RTA is unable to extend his right knee. Root value involved is=L2-L3-L4

C3, C4, C5

- What one of the following is Phrenic nerve root value= C3, c4, c5
- Nerve supply of diaphragm= C3, 4, 5

OTHERS

- A stab wound at supraclavicular region causes lesion of axillary, Musculocutaneous and long thoracic nerve. Which among the following is involved= C5 (C5>C6---if c5 not in options prefer c6)
- Deltoid weakness, reduced biceps jerk, numbness of thumb - which nerve root= C5, C6
- Thyrohyoid muscle nerve supply= C1 through hypoglossal nerve
- Ansa cervicalis is formed by= C1, C2, C3 + hypoglossal
- Cremasteric reflex elicited due to= Genitofemoral nerve
    - Note about cremasteric reflex
        - ✓ afferent - Femoral br of Genitofemoral nerve and Ilioinguinal (L1)
        - ✓ efferent - Genital br of Genitofemoral Nerve
- Ventral rami of c3 c4 form= Supraclavicular Nerves
- A 35 yr old labour with acute sudden pain starting from lower lumbar area and radiating along post aspect of left lower limb. Symptoms started after lifting heavy weight 3 days ago. O/E straight leg raising restricted to 30° on left side, decreased sensation along lateral border of left foot, weakness of left flexor halluces longus and diminished ankle jerk. Compression of which of likely to be=S1 nerve root
- Numbness of ear lobule while doing internal jugular lymph node biopsy. Which of following nerve is damaged =Greater auricle

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548. JEJUNUM IS SUPPLIED BY= SMA

ALSO REMEMBER QUESTIONS IN PREVIOUS PAST PAPERS ABOUT BLOOD SUPPLY

- Blood supply of medulla= PICA (Posterior inferior cerebellar artery)
- In some children Dorsalis pedis Artery Is missing congenitally. Then dorsum of foot will be supplied by which artery= Peroneal artery
- Long bones (lower end) supplied by= epiphyseal artery
- Gluteus maximus is supplied by= Inferior gluteal artery
- Suprarenal gland is supplied by= Greater Thoracic Splanchnic nerve
- Pars distalis= supplied by superior Hypophysial artery
- Sternohyoid muscle is supplied by which nerve= Ansa cervicalis.
- Leg area in representational area of cerebral cortex supplied by= Anterior cerebral artery
- True about Left suprarenal gland= Supplied by inferior phrenic artery

- Gall bladder is supplied by= Cystic artery
- Proximal part of bile duct supplied by= Cystic artery
- Proximal part of CBD supplied by= Cystic artery
- Rectum also supplied by= Median Sacral
- Jejunum supplied by= SMA
- Appendix is supplied by appendicular artery which is branch of= Terminal branch of ileocolic artery (The appendicular artery is a branch of the ileal or posterior cecal branch of the ileocolic artery)
- Obturator internus muscle is supplied by which nerve= Sacral plexus
- Sweat gland is supplied by= Sympathetic cholinergic
- Regarding anal canal which is true= supplied by both superior & inferior rectal artery
- True is= Long bone epiphysis is supplied by epiphyseal artery
- First 2 cm of duodenum is supplied by= Supraduodenal artery
- Posterior interventricular septum is supplied by= Middle cardiac vein
- Regarding cardiac muscle= Supplied by autonomic nervous system
- Pulmonary artery supplies which of the following=Alveoli
- The blood supply of scalp is from=External carotid artery
    - Note --if this is not in option then choose any branch of external carotid artery—External carotid artery supplies scalp via 3 branches that is--- Superficial temporal –Posterior auricular –and Occipital
- Supply to adrenal medulla is from=Greater thoracic splanchnic
- The middle cerebral artery supplies=Insular cortex and overlying opercula
- Which of following receive sub capsular afferent supply=Lymph node
- SMA supply to=Duodenojejunal junction to 2/3 of transvers colon
- Parasympathetic nerves supplying the urinary bladder are=Pelvic splanchnic nerves
- Lateral aspect of the foot is supplied by which of the following nerves=Sural nerve
- A pt. presents with nose bleed. Artery involved in epistaxis is=Sphenopalatine
- All the short muscles of hand are supplied by=T1
- Birth canal is supplied by= Inferior hypogastric plexus > Pudendal nerve
- True about Left suprarenal gland=Supplied by inferior phrenic artery
- Which structure has dual autonomic blood supply but not reciprocal supply=Salivary gland
- Blood supply to uterus=Uterine and ovarian artery
- External anal sphincter supplied by=Pudendal nerve

KNOW THE DIFFERENCE

- Which part of parietal pleura supplied partially by phrenic nerve= Diaphragmatic
- Muscles of back are supplied by= Posterior (Dorsal) rami of spinal nerves
- Trunk muscle supplied by= Dorsal rami of spinal nerve
- Intercostal muscles are supplied by= Anterior (ventral) rami of spinal nerves

THORAX

547. STERNOCOSTAL SURFACE OF THE HEART IS FORMED BY= RT VENTRICLE

REMEMBER

- Right border of heart is made by= Right atrium.
- Right border of heart on X-RAY made by= SVC + Right Atrium
- Anterior surface (Sternocostal surface) of heart mainly formed by= Right ventricle
- The subcostal surface of the heart is formed primarily by the anterior wall of which heart chamber=Right ventricle

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548. STRUCTURE ARCHES OVER ROOT OF LEFT LUNG= AORTA

EXPLANATION:

Lung Roots Relations	
	Structures which arches over root of lung ○ Over Left lung root → Aorta ○ Over Right lung root→ Azygous vein Structures anterior to root of both lungs→ Phrenic nerve Structures posterior to root of both lungs→ Vagus nerve Pulmonary trunk relation with the bronchus at the hilum of the lung-mnemonic is (RALS) →Right Anterior & Left Superior.

- Right lung is a more common site for inhaled foreign bodies
- Because right main stem bronchus is wider, more vertical, and shorter than the left.
- While during bronchoscopy the first structure visualized is= upper lobe bronchus
- If you aspirate a peanut:
  - While upright—enters basal (posterior) segments of right lower lobe.
  - While supine—enters Apical (superior) segment of right lower lobe. Preferentially on right side.

NOW LET'S SOLVE SOME PAPER MCQ'S

- What nerve loops around arch of aorta = left recurrent laryngeal nerve.
- Which of the following arches over root of right lung = azygous vein
- A boy inhales a coin, in which bronchus the coin will lodge= Right lower
- Inhaled foreign body in which segment= Right lower bronchus
- A surgeon is performing bronchoscopy on a patient which of the following will be seen first by the surgeon= Right upper lobe bronchus
- Foreign body most commonly goes to= Right lung lower lobe
- A patient with aspiration pneumonia develops chest pain with dullness on percussion in area medial to the medial border of scapula on elevation of arm. Which part of lung is most likely to be affected = Right apical lobe
  - (medial border of scapula on elevation of arm corresponds to oblique fissure of right apical lobe)
- Patient in supine position, aspirates gastric context. It will most likely go into=Apical segment of lower lobe right lung
- Percussion of the posterior aspect of the chest along the scapular line in sitting position resonates most likely till which rib= 10th rib

KNOW THE DIFFERENCE

- ❖ Inhaled foreign body most likely gets lodged in which bronchus= **RIGHT LOWER**
- ❖ A 3 years old baby inhaled something after which he had SOB. O/E breath sounds on the right were normal while on the left side they were absent. CXR confirmed foreign body lodged in **LEFT LOWER** bronchus. What is your diagnosis= Situs inverses
    - ○ Situs inversus (also called situs transversus or oppositus) is a congenital condition in which the major visceral organs are reversed or mirrored from their normal positions. The normal arrangement of internal organs is known as situs solitus

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549. REGARDING BRONCHOPULMONARY SEGMENTS= SUPPLIED BY TERTIARY BRONCHUS

REGARDING BRONCHO PULMONARY SEGMENTS

- ✓ There are ten segments in the right lung (upper lobe-three, middle lobe-two; lower lobe- five) and eight to nine segments in the left lung (upper lobe-four; lower lobe-four to five).
- ✓ It's pyramidal in shape with apex pointed in the direction of the hilum and base in the direction of the top layer of the lung.
- ✓ It's encompassed by the connective tissue.
- ✓ It's aerated by the segmental (tertiary) bronchus.
- ✓ Every section has its very own artery, a segmental branch of the pulmonary artery.
- ✓ Every section has its own lymphatic drainage and autonomic provide.

NOW LET'S SOLVE SOME PAPER MCQ'S

- ❖ How many bronchopulmonary segments in right lung= 10
- ❖ How many bronchopulmonary segments in left lung= 10 (8-10, prefer 10 option if present)
- ❖ Which lobe has 3 bronchopulmonary segments= Right superior
- ❖ Which lobe has only 2 bronchopulmonary segments= Right middle lobe
- ❖ Seventh bronchopulmonary segment in the left lung= Medial basal
- ❖ Regarding bronchopulmonary segment= Supplied by segmental bronchus with terminal branch of artery
- ❖ Regarding bronchopulmonary segment= Each segment has its own artery and bronchus
- ❖ Tertiary segmental bronchus is differentiated from following in not having cartilage= Terminal Bronchioles
- ❖ Which is correct regarding bronchopulmonary segment= Aerated by tertiary bronchus
- ❖ Tubular airway with lots of air sacs= Alveolar duct
- ❖ Carcinoma of apex of lung. Which segment will collapse= apical superior
    - ○ It also comes as
        - ▪ If there is a tumor in the right superior lobar bronchus. The bronchopulmonary segment most likely to be collapsed would be= Apical superior
        - ▪ Tumor of superior segment of lung causes collapse of which segment= Apical superior
        - ▪ With blockage of right superior bronchus due to mass, which bronchopulmonary segment is likely to collapse= Right Apical superior
- ❖ Air enter into the bronchopulmonary segments through= Tertiary bronchi
- ❖ Clara cells found in= Terminal bronchiole
- ❖ Difference between Right lung root from left Lung root= Number of Primary Bronchi
- ❖ Right lung different from left lung= Larger in size
    - ▪ (The left lung is smaller because of the space taken up by the heart)
- ❖ The respiratory zone where gaseous exchange occurs extends beyond= Terminal bronchioles to alveoli
- ❖ No of divisions in lower airway= 23
- ❖ Left lower lobe lung differ from right upper lobe lung by not having= Medial basal segment

KNOW THE DIFFERENCE IN THESE TWO QUESTIONS--- SEQUENCE

- ❖ Bronchopulmonary segments arrangement on Rt side= 3,2,5
- ❖ How many bronchopulmonary segments are in lower, middle and upper lobe of right lung respectively= 5,2,3

550. AORTIC ANEURYSM AT AORTIC OPENING IN DIAPHRAGM WHICH STRUCTURE WILL BE COMPRESSED= AZYGOUS VEIN + THORACIC DUCT

NOTE

Opening in diaphragm (V.O.A)	Just count the number of letters and you'll remember opening ❖ Vena-cava opening (T8 level) ○ Structures passing → Inferior vena cava and phrenic nerve ❖ Oesophagus opening (T10 level) ○ Structures passing→Oesophagus, Vagus nerve (CN-10), Left gastric artery, esophageal veins ❖ Aortic hiatus (T12 level)—red, white, blue ○ Structures→ Aorta(red), Thoracic duct (white), Azygous vein(blue) ○ It is the lowest and most posterior of the large apertures

ALSO REMEMBER RELATED QUESTIONS IN PREVIOUS PAST PAPERS

- Aorta opening in diaphragm= T12
- Esophageal opening in diaphragm is at the level of= T10
- At esophageal opening which structure is accompanied by esophagus= Vagus nerve
- Which structure passes from the most posterior hiatus of diaphragm= Azygous vein
- Which of the following structure passes thru aortic hiatus= Azygous vein
- Aneurysm of Aorta at aortic opening will compress= Thoracic duct and Azygous vein
- Vein that directly drains into SVC= Azygous vein
- Ligament arteriosus is present in between= Aortic arch and left pulmonary artery
- Which of the following structure pass through the posterior diaphragmatic opening=Aorta, azygous and thoracic duct
    - Note that-----posterior diaphragmatic opening refers to aortic opening
- In the aortic opening if the diaphragm is constricted, which of the following structure will be compressed along with aorta=Thoracic duct and azygos vein
- The esophagus passes through esophageal opening with=Vagus nerve and esophageal vessels
- Due to blockage of Azygous vein which of the following tributaries will be enlarged/engorged= Right subcostal and right ascending lumbar
- Which of the following tributaries will dilate as a result of lung tumor compressing azygous vein=Right ascending lumbar and subcostal

551. LENGTH OF THORACIC DUCT= 45CM (LENGTH IS BETWEEN 36-45 CMS)

REMEMBER SOME OTHER MCQ'S ABOUT THORACIC DUCT

- Thoracic duct opens into= Confluence of left internal jugular & left subclavian vein
- Thoracic duct drains into= Junction of left subclavian and internal jugular vein
- Thoracic duct drains into=Brachiocephalic trunk
- Aneurysm of Aorta at aortic opening will compress= Thoracic duct and Azygous vein

552. NEUROVASCULAR BUNDLE IS PRESENT IN CHEST WALL BETWEEN= INTERNAL AND INNERMOST LAYER

Know this

- **Vessel's arrangement:**
    - Form above downwards – (VAN)------Vein, Artery then Nerve
- Neurovascular bundle in chest wall lies between internal and innermost layers.
- Regarding intercostobrachial nerve= 2nd intercostal is sensory.
- **Blood supply:**
    - Anteriorly:

        - up to 6th intercostal space = internal thoracic artery
        - Below 6th space= phrenic artery
    - Posteriorly:
        - First 2 intercostal spaces= superior intercostal
        - 3-9 intercostal space= thoracic aorta

- Anterior intercostal arteries originate from the internal thoracic artery and supply the anterior intercostal spaces.
- Posterior intercostal arteries arise from the thoracic aorta (except 1st and 2nd spaces) and supply the posterior intercostal spaces

NOW LET'S SOLVE SOME PAPER MCQ'S

INTERCOSTAL ANATOMY

- Neurovascular bundle in the intercostal space is arranged in = Vein, artery, nerve
    - It also comes as
        - From cephalic to caudal, the neurovascular bundle in the intercostal space are arranged in which order= Vein, artery, nerve
- Neurovascular bundle in chest wall is between = Internal and innermost layer
- Intercostal neurovascular bundle is located = Just beneath the lower border of the ribs
- First structure to be traumatized under rib when passing chest drain= Intercostal nerve

THORACIC ARTERIES AND VEINS

- Intercostal artery originates from = Arch of aorta
- Which artery lies almost behind the sternum= Internal thoracic artery
    - It also comes as
        - Artery lying almost behind the sternum = Internal thoracic artery
        - Artery seen behind the sternum = Internal thoracic artery
        - Behind sternum vertically seen = Internal thoracic artery
- Pericardiophrenic artery is a branch of = Internal thoracic artery
- Posterior intercostal arteries at 5th intercostal space are branches of = Thoracic aorta
- Anterior intercostal arteries are branches of = Internal thoracic arteries
- Unlikely feature of the internal thoracic artery = Terminates in 8th intercostal space
- Right bronchial artery most likely arises from = 3rd right posterior intercostal artery
- First posterior intercostal vein drains into = Brachiocephalic vein
- Veins of thorax: left superior pulmonary vein is = Anterior to the left pulmonary artery
- Regarding thoracic wall, appropriate statement = The anterior intercostal arteries are branches of the internal thoracic arteries

MUSCLES AND NERVE SUPPLY

- Muscles of back are supplied by = Dorsal rami of spinal nerves
- Pectoralis Major flap blood supply = Thoraco-acromial artery
- Type of regional anesthesia associated with greatest serum concentration of local anesthetic is = Intercostal
- Intercostal nerves = Are linked to sympathetic chain
- Injury to intercostobrachial nerve results in = Loss of sensory fibers 2nd intercostal nerve
- Subcostalis muscle is supplied by= Intercostal nerve
- Ileocostalis muscle is supplied by= Dorsal rami of spinal nerves
- Both sides of 5th posterior intercostal spaces are supplied by= Thoracic aorta

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553. KNIFE PIERCES INTERCOSTAL SPACE; LAYERS PIERCED BEFORE LUNG SUBSTANCE = 8 LAYERS

NOTE:

- Layers pierced (lung): 8 layers.

  - Skin → Superficial fascia → External intercostal → Internal intercostal → Innermost intercostal → Endothoracic fascia → Parietal pleura → Pleural cavity → Lung
- Next layer after muscles: Endothoracic fascia.
- Key damaged structures (common sites):
  - 5th ICS, midclavicular → right ventricle.
  - Below xiphisternum → IVC.
  - Near sternum → Pericardium or internal intercostal muscle.

NOW LET'S SOLVE SOME PAPER MCQ'S

- Knife pierces intercostal space; layers pierced before lung substance = 8 layers
- Bullet passing intercostal space first pierces after muscles = Endothoracic fascia
- Stab wound at 5th intercostal space, left midclavicular line. Most likely punctured = Right ventricle
- Wound at left 4th Intercostal space, left edge of sternum pierces = Internal intercostal muscle
- Stab wound just right and below Xiphisternum at 6th intercostal cartilage. Structure damaged is = IVC
- Thorax region with resonant percussion note = Right 2nd–4th intercostal space, midclavicular line
- A 23-year-old man is stabbed in a bar fight. The knife enters the chest in the left 5th intercostal space, just lateral to the sternum, piercing to a depth of approximately 4 cm. What structure is most likely damaged = Pericardium

554. ANTERIOR INTERCOSTAL ARTERIES ARE BRANCHES OF=INTERNAL THORACIC ARTERY

NOTE THE FOLLOWING BRANCHES

- Which branch of internal iliac artery lies in true pelvis throughout its course=Middle rectal artery
- Pancreatic magna artery is a branch of=Splenic
- Iliolumbar artery is branch of=Internal iliac
- Four lumbar arteries originate from=Aorta
- Musculophrenic artery is branch of=Internal thoracic
- The only medial branch of external carotid artery is=Ascending pharyngeal artery
- Which of the following is a branch of internal iliac that remains in the true pelvis= Middle rectal artery
- Iliolumbar artery is branch of= Internal iliac
- Right bronchial artery is a single artery branch of= 3rd posterior intercostal artery
- Which artery lies almost behind the sternum= Internal thoracic artery

555. SKELETAL AND SMOOTH MUSCLE AT THE JUNCTION IN UPPER GIT ARE FOUND IN=MIDDLE 1/3 ESOPHAGUS

NOTE THAT

- The upper third of the esophagus contains striated muscle, the lower third contains smooth muscle, and the middle third contains a mixture of both

ALSO NOTE THE ARTERIAL SUPPLY

a. Upper third→ Inferior thyroid artery
b. Middle third→Branches from descending thoracic aorta
c. Lower third→ Left gastric artery

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Blood supply to the upper 1/3 of the esophagus is from= Inferior thyroid artery
- Blood supply of middle esophagus is by= Descending thoracic aorta

THE MEDIAL ARCUATE LIGAMENT IS FORMED DUE TO A THICKENING IN= PSOAS FASCIA

REMEMBER

- Medial arcuate ligament → Psoas fascia
- Median arcuate ligament → Diaphragm
- Lateral arcuate ligament → Quadrates lumborum

557. **EDEMA CAUSED BY = LYMPHATIC OBSTRUCTION**

558. **MAN IS SUFFERING FROM TESTICULAR CA; THE LYMPHATIC DRAINAGE OF TESTIS IS INTO =PARA AORTIC LYMPH NODES**

REGARDING METASTASIS AND LYMPHATIC DRAINAGE (THOSE WHICH HAD COME REPEATEDLY)

Celiac	❖ Liver, stomach, spleen, pancreas, upper duodenum
Superior mesenteric	❖ Lower duodenum, jejunum, ileum, colon to splenic flexure
Inferior mesenteric	❖ Colon from splenic flexure to upper rectum
Internal iliac	❖ Lower rectum to anal canal (above pectinate line), bladder, vagina (middle third), prostate
External iliac	❖ External genitalia, vagina, and Cervix, uterus, bladder
Para-aortic	❖ Testes, ovaries, kidneys, uterus
Superficial inguinal lymph nodes	❖ Anal canal (below pectinate line), skin below umbilicus (except popliteal territory), scrotum, perianal skin, anus, Lower 1/3rd of vagina, vulva, labia majora
Popliteal	❖ Dorsolateral foot, posterior calf

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Lymphatic drainage of Ovaries= Para aortic lymph nodes
  - But note that
  - Ovarian cancer first metastasizes to= Peritoneum > Para aortic lymph nodes
- Lymphatic drainage of Testes= Para aortic lymph nodes
- Lymph drainage form scrotum= Superficial inguinal lymph nodes.
- Lymphatic drainage of Glans penis and corpora into= Deep inguinal nodes
  - It also comes as with no option of deep inguinal nodes—so than choose
    - Lymphatic drainage of Glans penis and corpora is=Internal iliac nodes
      - Glans and corpora drain to the deep inguinal nodes, and later to the internal
- Lymph drainage form Labia majora= Superficial inguinal lymph nodes (horizontal group)
- Vagina drainage= Medial group of superficial inguinal lymph nodes (horizontal)
- Cervical carcinoma, lymph drainage= Both internal & external iliac (if only one to choose –click internal iliac)
  - It also comes as
    - In Cervical carcinoma stage 4a which lymph node is involved= Internal iliac
- Bladder drainage= External iliac
- Lymph drainage of perianal skin= Medial group of horizontal superficial nodes
- Lymphatic drainage of anus= Medial group of Superficial Inguinal Lymph nodes
- Lymphatic drainage from vulva = Medial group of superficial inguinal lymph node
- Lymphatic drainage from ant 2/3 of tongue= submandibular
- Lymphatic drainage of thyroid= Deep cervical lymph nodes
- Deep cervical lymph nodes drain= Posterior triangle of neck
- Lymphatic drainage of prostate= Internal iliac
- Ca of greater curvature of the stomach will likely spread to which lymph node= Celiac node
- Lymph from greater curvature of stomach drains into which of the following node= Celiac
  - Lymph from the fundus of stomach will drain into which node= Celiac nodes
    - Note this

Tongue lymph

  - (Pancreatico-splenic nodes drain fundus of stomach which then drains into celiac nodes)
- ❖ Lymphatics drainage of sigmoid colon accompanies which artery= Inferior mesenteric
- ❖ Lymphatic drainage of CA rectum= Para rectal
  - o (don't be confuse as I have stated that lower rectum drains into internal iliac—but the superior rectum drains into pararectal lymph nodes, so that's why here para rectal lymph nodes is the option)
- ❖ Less likely route of spread of endometrial CA of uterus is via= Vascular
- ❖ Lymph drainage of vagina from below hymen is by= Superficial inguinal nodes
- ❖ A patient with breast malignancy has been radiotherapy now presented with swelling of the hand. Cause is= Lymphatic obstruction
- ❖ Lymphatics related condition= Cystic hygroma
- ❖ Cystic hygroma is associated with= turner syndrome
  - o Although cystic hygroma can be associated with turner, down and Noonan syndrome
  - o But The most characteristic congenital malformation associated with Turner syndrome is cystic hygroma
- ❖ Lymphatic Drainage of appendix= Meso-appendix
- ❖ Lymphatic drainage of back at level of t10 vertebrae= Post Axillary node
  - o Note the difference
    - ▪ Lymphatic drainage of back above iliac crest= Post Axillary node
    - ▪ Lymphatic drainage of back below iliac crest= lateral group of superficial inguinal lymph nodes
- ❖ Lymphatic drainage of skin of lateral side of foot= Popliteal lymph nodes
- ❖ A patient present with right hypochondriac pain. After admission she develops amoebic lung abscess developed. Reason= Direct spread from liver
- ❖ Female after radical mastectomy swelling and edema in anterior upper side of arm cause of edema= Lymphatic obstruction.
- ❖ A smoker with 90 pack year presents with weight loss and malaise. His X-ray shows perihilar shadows and histology shows squamous atypical cells. SCC metastasizes through= Lymphatics
- ❖ Prostatic cancer metastasizes to= Vertebrae
- ❖ An old male came to OPD with urinary retention and CNS symptoms. O/E prostate was stony hard. On CT scan there was lesions in the cerebrum. What was the route of spread to the brain=Vertebral venous plexus
- ❖ A 50-year man suffering from carcinoma of prostate showed areas of sclerosis and collapse of T10 and T11 vertebrae in X-ray. The spread of this tumor to the above vertebrae was most probably through=Internal vertebral plexus of veins
- ❖ Carcinoma (adenocarcinoma)of colon will metastasize first to=Liver
- ❖ Carcinoma of nipple, lymph drainage of this area is by= Anterior axillary
- ❖ Infection from an inflamed appendix is likely to spread via lymphatics to= Superior mesenteric nodes
- ❖ The lymph drainage of the skin covering the medial side of the knee joint is into the= Vertical group of superficial inguinal nodes
- ❖ Tumor of which of the following results in involvement of Submental and submandibular lymph nodes= Lower lip
- ❖ Infection of the big toe is carried to which of the following lymph node= Vertical group of superficial inguinal lymph nodes
- ❖ A laborer while working got his right thumb lacerated accidentally. His 1st web space is infected. Lymphatic drainage will be to= Infraclavicular nodes
- ❖ Infection of the first web space will be first drained by= Infraclavicular lymph node
- ❖ Lymph drainage from back of skin at level t10 vertebrae is by=Post Axillary node

ALSO REMEMBER THESE MCQS

- ❖ Role of lymphatics= To present antigen to lymphocytes

- ❖ Regarding Lymph node= Drain tissue fluid (I have seen people making errata for it—there was no op drain lymph fluid)
- ❖ Regarding lymph= Increase clearance in muscular activity
- ❖ Lymph flow will decrease in= Hemorrhage
- ❖ Fats enter the lymph in the form of= Chylomicron
- ❖ Lymphoid flow is decreased by increase in= Capillary oncotic pressure
- ❖ Lymphocytes from blood enter lymph node via= Sub capsular afferent lymphatics in cortex

9. LYMPHATICS FROM MEDIAL QUADRANT OF BREAST DRAINS=INTERNAL THORACIC NODES

REMEMBER ABOUT DRAINAGE

- o Lymph drainage from lateral quadrant:
- o The majority of lymph (>75%), particularly from the lateral quadrants, drains to the axillary (pectoral) lymph nodes.
- o Lymph drainage from Medial quadrant:
- o Parasternal nodes/internal thoracic nodes
- o Lymph from medial quadrant may also drains into the opposite breast.
- o Lymph drainage from inferior Quadrant
- o Inferior phrenic lymph nodes.

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ The lower inner portion of breast does not include which lymphatic drainage= Pectoral (anterior) Axillar node
- ❖ A patient presented to her doctor with a small axillary mass. O/E the doctor found a mass in upper oute quadrant of the breast. The lymphatic drainage of that part is to=Pectoral axillary nodes
- ❖ Pectoral nodes drain=Major part of breast
- ❖ Upper outer quadrant breast tumor lymph will drain into=Pectoral
- ❖ Lymphatic drainage of CA breast= Anterior axillary lymph nodes
- ❖ Breast lymphatic drainage parallel to which vessel= Axillary vessel with axillary lymph node
- ❖ Lymphatic drainage of medial quadrant of breast= Internal thoracic nodes
- ❖ Lymphatic drainage of lateral quadrant of breast= Anterior group of Axillary lymph nodes
- ❖ Sequence of major breast lymph nodes in parallel= Along internal thoracic to internal thoracic nodes

ALSO NOTE THESE MCQS ABOUT BREAST

- ❖ Terminal duct of breast drains into= Lactiferous duct
- ❖ In females, the breast lies over=Pectoral fascia
- ❖ Regarding breast what is true= contains 15-20 lactiferous ducts

CHAPTER # 22

ABDOMEN PELVIS AND PERINEUM

560 **EXTERNAL SPERMATIC FASCIA IS FORMED BY: = EXTERNAL OBLIQUE**

REMEMBER FEW IMPORTANT POINTS ABOUT INGUINAL CANAL REPEATEDLY ASKED

- The inguinal canal extends from the deep inguinal ring to the superficial inguinal ring.
- The deep inguinal ring is an oval opening in the fascia transversalis
- The superficial inguinal ring Is a triangular gap in the external oblique aponeurosis
- Structures Passing through the Canal
    - The spermatic cord in males, or the round ligament of the uterus in females.
    - The ilioinguinal nerve.
- Coverings of Spermatic Cord (From within outwards)
    - The internal spermatic fascia (derived from the fascia transversalis)
    - The cremasteric (derived from the internal oblique)
    - The external spermatic fascia (derived from the external oblique aponeurosis)
- Also remember that
    - The conjoint tendon is formed by fusion of the internal oblique and of the transversus muscles

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Pampiniform Plexus is located in=Inguinal canal
    - Remember sometimes an option for spermatic cord and inguinal canal both are present in such scenario = remember Spermatic cord > inguinal canal
- Internal oblique muscle forms which of the following structures= Cremasteric muscle
    - It also comes as
        - Aponeurosis of internal oblique muscle form=Cremasteric fascia
- Internal oblique muscle aponeurosis form which of the following=Conjoint tendon
    - Note
        - Conjoint tendon is formed by internal oblique and trasverse
- Superficial epigastric artery is a branch of= Femoral
- Which nerve traverses the superficial inguinal ring=Ilioinguinal
- Lacunar ligament is medial rolled up part of=Reflected inguinal ligament
- External oblique fibers interdigitate with=Serratus interior
- Upper part of abdominal external oblique muscle interdigitates with=Serratus anterior
- A 5 years old child presented with unilateral cryptorchidism and testis is present outside scrotum but within inguinal canal. Which of the following is more likely to occur in this child=Malignancy
- The femoral sheath of the femoral vessels is formed by the=Fascia transversalis and the fascia Iliaca
- Internal spermatic fascia is derived from=Fascia Transversalis
- Which of the following structure is continuous with internal spermatic fascia=Fascia transversalis

RECTUS SHEATH

- Rectus sheath at the level of umbilicus anteriorly formed by=By layer of internal oblique muscle aponeurosis with external oblique
- Posterior wall of rectus sheath above the level of arcuate line is formed by=Aponeurosis of transverses abdomen and Internal oblique

KNOW THE DIFFERENCE

- Deep inguinal ring is formed by= fascia transversalis

- It also comes as
    - Lateral wall of deep inguinal ring is formed by= Fascia transversalis
- Superficial inguinal ring forms by opening in =external oblique aponeurosis

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561. **TUNICA VAGINALIS IS DERIVED FROM=PARIETAL PERITONEUM**

NOTE THAT

- Coverings of the Testis: (from outwards to inside)
    - Tunica Vaginalis, Tunica Albuginea, Tunica vasculosa
- Hydrocele Is serous fluid filling and distending the tunica vaginalis.

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Needle passed to drain fluid of hydrocele from Tunica vaginalis. Which structure is not pierced during the process=Tunica albuginea
- Fluid of hydrocele is collected in=Tunica Vaginalis

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562. **A MULTIPAROUS WOMAN PRESENTED WITH A PULSATILE AND EXPANSIBLE THIGH MASS BELOW INGUINAL LIGAMENT BUT NO FEVER. REST OF THE EXAMINATION WAS UNREMARKABLE. DIAGNOSIS= FEMORAL ARTERY ANEURYSM**

REMEMBER ABOUT HERNIAS

Direct inguinal hernia	When the contents of the hernia enter the inguinal canal, not through the deep ring, but through the posterior wall (lying medial to the inferior epigastric artery).	Mnemonic: “MDs don’t Lie” Medial to inferior epigastric vessels = Direct hernia. Lateral to inferior epigastric vessels = Indirect hernia.
Indirect inguinal hernia	When the contents of the hernia enter the inguinal canal by passing through the deep inguinal ring (lying lateral to the inferior epigastric artery) the hernia is said to be indirect.	
Hesselbach's triangle	Boundaries: ▪ Medially: lateral border of the rectus abdominis ▪ Laterally: inferior epigastric artery ▪ Below: inguinal ligament.	Direct hernia occurs through Hesselbach's triangle
Femoral hernia	Femoral hernia Protrudes below inguinal ligament through femoral canal below and lateral to pubic tubercle. More common in females Lateral to medial: Nerve-Artery-Vein-Lymphatics.	Mnemonic: You go from lateral to medial to find your NAVeL. Other Mnemonic: Venous near the penis.
Diaphragmatic hernia	Abdominal structures enter the thorax, may occur due to congenital defect of pleuroperitoneal membrane, or as a result of trauma.	

NOW LET'S PRACTICE SOME PAPER MCQ'S

FEMORAL HERNIA

- o It also comes as
    - Lateral wall of deep inguinal ring is formed by= Fascia transversalis
- ❖ Superficial inguinal ring forms by opening in =external oblique aponeurosis

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Diaphragmatic hernia	Abdominal structures enter the thorax, may occur due to congenital defect of pleuroperitoneal membrane, or as a result of trauma.	

NOW LET'S PRACTICE SOME PAPER MCQ'S

FEMORAL HERNIA

- Femoral hernia passes under= inguinal ligament
    - It also comes in this way
        - Femoral hernia goes into the thigh just behind= Inguinal ligament
        - Femoral hernia extension into thigh=Posterior to inguinal ligament
- In Femoral hernia, which structure is the most laterally= Femoral nerve
- After femoral hernia repair, patient complains of post op swelling over the site of incision. Which vessel is likely to be damaged= Femoral vein
- Regarding femoral canal= Allow femoral vein to distend during increases venous return

INGUINAL HERNIA

- During Right inguinal hernia surgery, most probable structure seen= Pampiniform plexus
- Hesselbach's triangle is site for= Direct inguinal hernia
- A surgeon is performing a normal inguinal hernia repair. Most likely structure to be encountered during this will be= Pampiniform plexus
- Protrusion from anterior abdomen lateral to inferior epigastric artery= Indirect inguinal hernia
- Structure most commonly seen in repair of right inguinal hernia= Pampiniform plexus

INCISIONAL HERNIA

- Abdominal organ removed, then patient develop incisional hernia. Which structure first come outward with hernia= Fascia transversalis
- Post hysterectomy patient develops Incisional hernia. Which structure is protruded= Transversalis fascia
- In Incisional hernia first structure present from inward to outward is= Transversalis fascia

OTHERS

- Congenital diaphragm hernia is caused by= Incomplete pleuroperitoneal membrane
- A 7 months' baby has dyspnea on lying and is relieved on upright position. On auscultation absent breath sounds. X-ray shows loops in the thorax. Diagnosis=incomplete pleuroperitoneal membrane
- A female operated for Appendectomy, 3 weeks later she now presents with irregular elevated hard area of incision. Diagnosis= Deformed scar
- A patient comes to you post op laparotomy. On examination his scar is raised and hard. Diagnosis= Scarring and Deformity
- Lumbar Triangle anteriorly bound by posterior border of= Ext Oblique

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563. BARE AREA OF LIVER IS LIMITED BY=CORONARY LIGAMENT

ABOUT LIGAMENTS

- During surgery, splenic vessels need to ligated. In which ligament are these vessels present=Lienorenal ligament
- Structure immediately medial to femoral hernia is=Laçunar ligament
- A sprained ankle resulting from excessive eversion. Most likely demonstrate that which structure is damaged=Deltoid ligament
- Vessels of the base of bladder lies in which ligament=Dorsolateral

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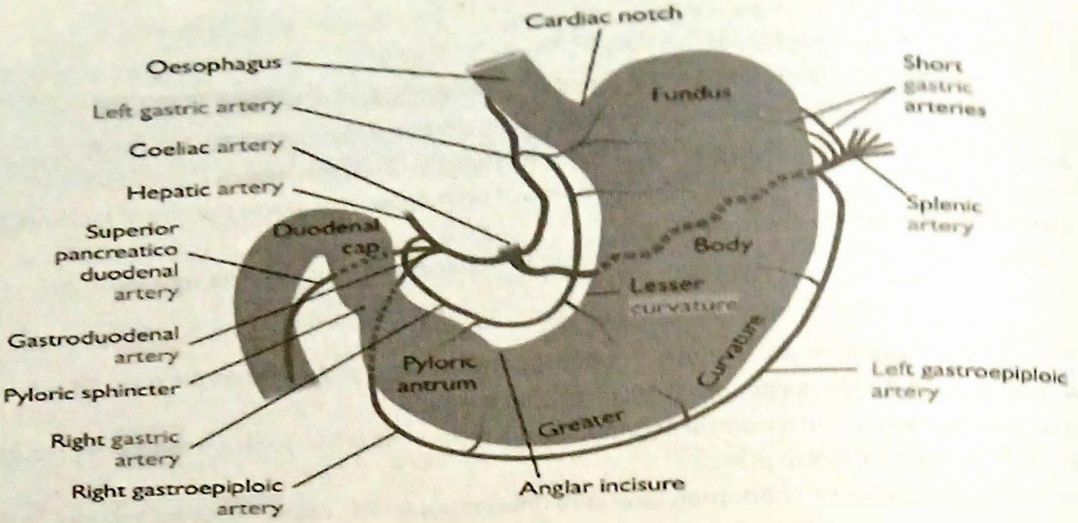
564. RIGHT GASTRIC ARTERY ORIGINATES FROM= COMMON HEPATIC ARTERY

BLOOD SUPPLY OF STOMACH

- **Left gastric artery,** which supplies the upper lesser curvature of the stomach from celiac trunk
- **The right gastric artery** branches off the hepatic artery, which originates from the celiac axis; it supplies blood to the distal lesser curvature
- **The left gastroepiploic artery** is a branch off the short gastric vessels; it comes from the splenic and therefore originally from the celiac axis
- **The right gastroepiploic artery** branches off the gastroduodenal artery, which comes originally from the hepatic artery and therefore from the celiac axis


Cardiac notch
Oesophagus
Left gastric artery
Coeliac artery
Hepatic artery
Superior pancreatico duodenal artery
Duodenal cap
Gastroduodenal artery
Pyloric sphincter
Right gastric artery
Right gastroepiploic artery
Fundus
Short gastric arteries
Splenic artery
Body
Lesser curvature
Pyloric antrum
Curvature
Greater
Left gastroepiploic artery
Anglar incisure

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Left gastric artery supplies= Lesser curvature
- Left gastric artery drains directly into= Portal vein
- Short gastric artery is a branch of= Splenic artery
- Cystic artery is a branch of= Right hepatic artery
- During Esophagectomy stomach is mobilized in upper portion of thorax to anastomose with pharynx. Which artery is mobilized for the supply of stomach=Right gastroepiploic artery
- A surgeon gives a subcostal incision which cuts the sup. Epigastric vessels but the rectus abdominus will not undergo necrosis due to anastomosis with= Inf. epigastric artery
- Superficial epigastric artery emerges through= Saphenous opening (Ref: Last's Anatomy: Regional and applied page 146)
- Which artery lies posterior to first part of duodenum= Gastroduodenal artery
- Damage to fundus of stomach it will bleed by= Short gastric arteries

KNOW THE DIFFERENCE

- Inferior epigastric artery is a branch of= External iliac artery
- Superficial epigastric artery is branch of = femoral artery

565. WHICH OF THE FOLLOWING IS A BRANCH OF CELIAC TRUNK=COMMON HEPATIC ARTERY

ABOUT CELIAC TRUNK MAJOR BRANCHES

- 1. Left gastric artery — Esophageal branch, gastric branch
- 2. Common hepatic artery — Right hepatic, left hepatic, gastroduodenal artery→ Supraduodenal, right gastroepiploic, superior Pancreaticoduodenal artery
- 3. Splenic artery — short gastric, left gastroepiploic, pancreatic branches

NOW LET'S PRACTICE SOME PAPER MCQ'S

- If celiac trunk is compressed by space occupying lesion, the structure LEAST likely to become ischemic is= Liver
- Artery arising directly from the aorta= Celiac trunk
- Pancreatic magna artery is a branch of= Splenic
- Right gastroepiploic artery is a branch of= Gastroduodenal
- Left gastroepiploic artery, a branch of the=Splenic
- Structure lying anterior to aorta is=Celiac plexus
- Which one of the following is a nerve block for upper abdominal viscera= Celiac block
- The unpaired artery of aorta is= Celiac

- Celiac plexus lies= Anteriorly to Aorta
- Celiac plexus is at the level of= T12-L1
- Accessory right hepatic artery arises from= Superior mesenteric artery
- First branch of abdominal aorta= Celiac trunk

KNOW THE DIFFERENCE

- Left gastric artery is a branch of= Celiac trunk
- Right gastric artery is a branch of= Hepatic artery
    - The right gastric artery usually branches from one of the hepatic arteries (common, proper or left hepatic)

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566. GREATER AND LESSER SAC COMMUNICATION VIA= EPIPLOIC FORAMEN

NOTE THESE MCQS ABOUT EPIPLOIC

- In acute Pancreatitis fluid accumulation in = Lesser sac
- Lesser sac is present between= Stomach and pancreas
- Lesser sac lateral relation is= Epiploic foramen
- Epiploic appendages are present on=Sigmoid colon
- Epiploic foramen is bounder inferiorly by=1st part of duodenum
- Correct relation of Lesser sac is=Superiorly by caudate lobe of liver

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567. ARTERIAL SUPPLY OF 1ST PORTION (2CM) OF DUODENUM IS FROM= SUPERIOR PANCREATICODUODENAL

NOTE BLOOD SUPPLY OF DUODENUM:

- Upper half of duodenum: superior pancraticoduodenal artery (branch of gastroduodenal artery)→ drains into portal vein
- Lower half of duodenum: inferior pancraticoduodenal artery (branch of superior mesenteric artery)→ drains into mesenteric vein

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Superior pancreaticoduodenal artery is branch of= Gastroduodenal artery
- Lower third duodenum blood supply= Inferior pancreaticoduodenal artery
- Which artery lies posterior to first part of duodenum= Gastroduodenal artery
- Anterior relation of the 3rd part of duodenum is to= Superior mesenteric artery

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568. ABDOMINAL ANGINA OCCURS DUE TO NARROWING OF= SUPERIOR MESENTERIC ARTERY

NOTE ABOUT COLON BLOOD SUPPLY

Ascending colon	Transverse colon	Descending colon
Lies in the right lower quadrant.	Occupying the umbilical region.	Lies in the left upper and lower quadrants
It extends upward from the cecum to right colic flexure and becomes continuous with the transverse colon.	It begins at the right colic flexure below the right lobe of the liver to the left colic flexure below the spleen	It extends downward from the left colic flexure to the pelvic brim, where it becomes continuous with the sigmoid colon
Blood supply ❖ Superior mesenteric artery (ileocolic and right colic branches)	Blood supply ❖ Proximal 2/3rd → superior mesenteric artery (middle colic artery).	Blood supply ❖ inferior mesenteric artery (left colic and the sigmoid branches)

	❖ Distal 1/3rd → Inferior mesenteric artery (left colic artery)	

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ A 60-year-old patient presents with severe abdominal pain. Endoscopic examination of large gut suggests abnormal mucosa from hepatic flexure to mid transverse colon. The most likely blood vessel involved is= Middle colic artery
- ❖ At which level does the superior mesenteric artery supply convert to inferior mesenteric artery supply in regard of colon= Transverse colon
- ❖ If the superior mesenteric artery is occluded giving abdominal angina, which structure is likely to be spared= Descending colon
- ❖ The occlusion of inferior mesenteric artery leads to= Damage of sigmoid and descending colon

ALSO NOTE THESE

- ❖ The ascent of horse shoe shaped kidney is prevented by=Inferior mesenteric artery
- ❖ Superior mesenteric and inferior mesenteric artery anastomose on= Marginal
- ❖ A young thin man is brought to the emergency. He has a stab wound measuring 3 cm vertically situated on the right lateral side of linea Alba below the umbilicus. Initially his BP and pulse were normal but later he goes into hemorrhagic shock. Which vessel is most likely to have been nicked= Inferior vena cava

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569. THE BLOOD SUPPLY OF RECTUM FROM THE FOLLOWING IS FROM= INFERIOR MESENTERIC

ABOUT RECTUM

Rectum	❖ Begins as continuation of sigmoid colon and ends at anal canal ❖ Arterial supply o Superior rectal artery (branch of inferior mesenteric artery) o Middle rectal artery (branch of internal iliac artery) o Inferior rectal artery (branch of internal pudendal artery) ❖ Nerve supply: o Sympathetic and parasympathetic (via inferior hypogastric plexuses)

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ The blood supply of LOWER rectum is from= Inferior rectal artery
- ❖ The superior rectal artery is a branch of the inferior mesenteric artery.
- ❖ The middle rectal artery is a branch of the internal iliac artery.
- ❖ The inferior rectal artery is branch of internal pudendal artery

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570. WHICH OF FOLLOWING STRUCTURE IS ANTERIOR TO BODY OF PANCREAS= LESSER SAC

NOTE

Head of Pancreas	Anteriorly→ Transverse colon, gastroduodenal artery Posteriorly→ IVC, Left renal vein
Neck	Posteriorly→ termination of Superior mesenteric vein and beginning of portal vein
Uncinate process	Anteriorly→ Superior mesenteric vessels Posteriorly→ Aorta

Body of pancreases	Anteriorly→ lesser sac

- Left renal vein lies posterior to= Head of pancreas
- Posterior relation of Head of Pancreas is to= IVC
- Terminal part of CBD in relation to pancreas is that it= Lies posteriorly
- The portal vein is usually formed by the confluence of the superior mesenteric and= splenic veins
    - it also comes as
        - Superior mesenteric vein and splenic vein join to form portal vein at which anatomical level= Behind neck of pancreas
- Accessory pancreatic duct is related to which part of pancreas= Upper part of head of pancreas
- Regarding relation of left renal vein, which is correct= Anterior to aorta
- The most appropriate statement concerning pancreas is= The uncinate process projects medially behind the superior mesenteric vessels
- Regarding the pancreas= The tail lies within two layers of the splenorenal ligament
- Which of the following structure is between celiac plexus and SMA= Pancreas
- Slow growing tumor of head of pancreas will compress= CBD

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571. WHICH ARTERY IS LIKELY TO BE DAMAGED IN CLOSE PROXIMITY OF PHRENIC NERVE= PERICARDIOPHRENIC ARTERY

ABOUT PHRENIC NERVE PAST PAPER MCQ; S

- Root value of phrenic nerve= C3, C4, C5
- Which structure is accompanied by Phrenic Nerve maybe at-risk during surgery=Pericardiophrenic artery
- The root value of phrenic nerve with major contribution is by=C4
- Phrenic nerve= Irritation causes pain to Shoulder tip
- Dome of diaphragm is supplied by= Phrenic nerve
- Avulsion of phrenic nerve at its origin causes= Unilateral paralysis of diaphragm (hemi diaphragmatic paralysis)
- Motor supply of diaphragm is from= Phrenic nerve
- Phrenic nerve damage results in= Respiratory reflex lost
- Phrenic nerve is accompanied by= Pericardiophrenic artery
- Fibrous and parietal pericardium is supplied by= Phrenic nerve

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572. WHICH STRUCTURE DAMAGE DURING APPENDECTOMY, WHILE GIVING INCISION ON MC'BURNEY'S POINT= ILLIOHYPOGASTRIC NERVE

REMEMBER THESE MCQ'S OF APPENDECTOMY:

- ✓ Nerve damaged = Illiohypogastric nerve **(common)**
- ✓ Artery damaged = deep circumflex iliac artery
    - So, if both nerve and artery options are given prefer illiohypogastric nerve
- ✓ Most common position of Appendix= Retrocecal
- ✓ Appendix is supplied by appendicular artery which is branch of= Terminal branch of ileocolic artery
    - Note that (The appendicular artery is a branch of the ileal or posterior cecal branch of the ileocolic artery)

ALSO NOTE THIS SOMETIMES ABOUT LOCATION IS ASKED BY GIVING CLINICAL FINDINGS

- ✓ The ecchymosis of flank seen in a patient with acute pancreatitis is named after = Grey Turner
- ✓ A patient with pain in abdomen and diagnosed as appendicitis. During examination patient complains of pain while flexion of hip and medial rotation. What is the most likely position of appendix= Pelvic
    - In acute appendicitis, extension of the hip may cause pain if the appendix is retrocecal, while flexion and medial rotation may cause pain if it is pelvic

573. FRACTURE OF SACRUM AND ISCHIUM THRUST IN PELVIC CAVITY CAUSES TEAR IN WHICH STRUCTURE= RECTUM

SOME MCQS ABOUT FRACTURE

- Father holding child from wrist and spinning him in circle child feels pain sit down and holds left hand on right semi prone elbow fracture to which joint= Proximal radio ulnar joint
- A patient suffered fracture of clavicle. Now he can't abduct his arm. Muscle involved is= Deltoid
- Fracture of sub-occipital which artery will damage= Vertebral artery
- Patient had RTA with fracture of pelvis and right femur with open fracture of left tibia. Vitals: BP 60/40 RR 24/min pulse 120/min. what will be first step of management in emergency= IV fluids
- 45 years' female with fracture of femur presented with limb swelling. What will be the next pathology= DVT
- Posterior superior dislocation of hip joint, which bone damge= Ilium and ischium
- Multiple bone fracture, BP: 70/50,1st step in management= Volume replacement
- Fracture of Pelvic outlet. Which structure will not be damaged= Acetabulum
- A child had a fracture for which cast is applied to his leg. After some time cast is removed and his calf muscles show reduced muscle mass. This is= Disuse atrophy.
    - It also comes as
        - A boy had a fracture of humerus for which in ER he was advised cast for a few days. After removal of cast, the limb muscles were atrophied. This is due to= Decrease actin and myosin protein synthesis

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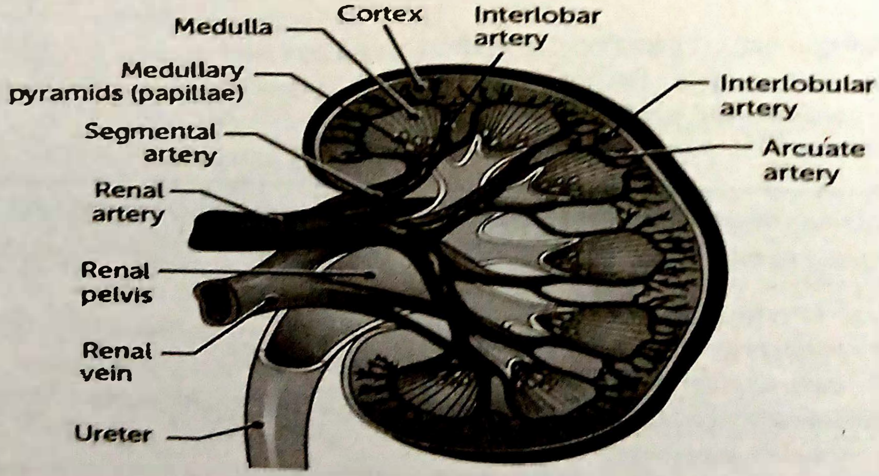
574. REGARDING RENAL COLUMN CONTAINS= INTERLOBAR ARTERY

- Don't be confuse in Interlobar and interlobular artery terms

REMEMBER THE SEQUENCE

- Renal artery → segmental artery→ interlobar artery → arcuate artery→interlobular artery→ afferent arteriole→ glomerulus → efferent arteriole →vasa recta/peritubular capillaries → venous outflow



NOW LET'S PRACTICE SOME PAPER MCQ'S

- Correct sequence for kidney among the following = renal, interlobar, arcuate, interlobular, efferent
- Medullary rays of kidney contain =collecting duct
- Which branch of renal artery supplies network around glomerulus= Interlobular
- Renal column arteries= Inter lobar
- Structure projecting from renal cortex in between renal pyramids is called= Renal columns
- Capsule of kidney is supplied by= interlobular artery
- The structure located in the renal column is = Interlobar arteries

575. THE BASE OF URINARY BLADDER IS MADE BY = POST SURFACE

NOTE THAT:

- The superior and part of the posterior surfaces of the bladder are covered by peritoneum
- Inferolateral surface of the bladder is devoid of peritoneum
- Urinary bladder and prostate is separated from rectum by= Denoviller's fascia also called rectoprostatic fascia
- Nerve supply:
    - Sympathetic (via superior and inferior hypogastric plexus)
    - Parasympathetic (via pelvic splanchnic nerves)
- Arterial supply:
    - Superior and inferior vesical arteries (branches of internal iliac artery)
- Lymph drainage:
    - Internal and external iliac nodes

NOW LET'S DISCUSS SOME PAPER MCQ's

- Regarding supply of urinary bladder= Supplied by pelvic splanchnic nerve & inferior hypogastric plexus.
    - It also comes as
        - Parasympathetic nerves supplying the urinary bladder are=Pelvic splanchnic nerves.
- Urinary bladder separated from rectum by= Denoviller's fascia
- Posterior to urinary bladder= Denoviller's fascia
    - Remember it also comes as
        - Urinary bladder and prostate is separated from rectum by= Denoviller's fascia (also called rectoprostatic fascia)
- Urinary bladder= Inferolateral surface not covered with peritoneum
- True about urinary bladder= Sympathetic + parasympathetic nerve supply
- Urorectal septum separates=Rectum and urogenital sinus
- Lymphatic drainage of urinary bladder= Internal iliac lymph nodes (if both internal and external in options prefer that)

576. NERVE LOSS IN UROGENITAL TRIANGLE IS = PUDENDAL NERVE

ALSO REMEMBER THESE MCQ's

- Landmark for pudendal nerve block= ischial spine
- In female neck of bladder lies above= urogenital diaphragm
- Urogenital diaphragm Laterally attached to= ischiopubic rami

577. EXTERNAL ANAL SPHINCTER SUPPLIED BY= PUDENDAL NERVE

ABOUT PUDENDAL NERVE

- Pudendal nerve root value---S2, S3, S4
- The pudendal nerve is the main nerve of the perineum
- It carries sensation from the
    - External genitalia of both sexes
    - Skin around the anus and perineum,
- Motor supply to
    - Various pelvic muscles (including levator ani)
    - Pelvic diaphragm
    - Male or female external urethral sphincter and the
    - External anal sphincter.
- If damaged, most commonly by childbirth, lesions may cause sensory loss or fecal incontinence.

- The nerve may be temporarily blocked as part of an anaesthetic procedure. Landmark for nerve block is ischial spine
- The internal anal sphincter is supplied by sympathetic nerves from the hypogastric plexuses

NOW LET'S PRACTICE SOME PAPER MCQ'S

- The internal anal sphincter receives its nerve supply from the= Hypogastric plexuses
- The Pelvic diaphragm is supplied by= Pudendal nerve
- Superficial external pudendal emerges from= Saphenous Opening
- A boy presented with haemorrhoids doc examined inferior rectal vein. That drains into= Internal pudendal
- Inferior rectal vein (or inferior hemorrhoidal veins) is a branch of= internal pudendal
- Pudendal Nerve root value= S2-S4
- Epidural block by reaching ischial spine, which nerve is blocked= Pudendal nerve
- Genital triangle Nerve supply lost nerve involved= Pudendal nerve
- Blood supply of skin of scrotum. External pudendal artery
    - Note:
    - The anterolateral surface is supplied by genital branch of the genitofemoral nerve.
    - Posterior surface is supplied by posterior scrotal nerves (from perineal nerve, branch of pudendal nerve)
- Pudendal nerve lies on= lateral side of ischiorectal fossa (As well on lateral side of pudendal canal)
- Sphincter urethrae is supplied by= Internal pudendal
- Levator ani nerve supply= Pudendal
- Nerve supply of vulva= Pudendal nerve
- Nerve supply of anal canal= Pudendal nerve
- Supply of internal sphincter muscles= Parasympathetic supply
- Structure damaged near ischial spine= Pudendal nerve
- Sensations lost in urogenital triangle. nerve blocked would be= Pudendal
- A child fell from 7 feet height. Later he develops urinary incontinence. Cause is=S2, S3, S4
- If afferent supply to the bladder is damaged, then it will cause which of the following=Urinary incontinence

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578. MAIN SUPPORT OF UTERUS = TRANSVERSE CERVICAL LIGAMENT (AKA CARDINAL LIGAMNET)

ALSO NOTE THAT

Ligament	Connects	Structures Contained	Notes
Suspensory ligament of the Ovary (Infundibulopelvic ligament).	❖ Ovaries to lateral pelvic wall	❖ Ovarian vessels	❖ (mnemonic: water (ureter) under the bridge (ovarian artery) ❖ Ureter is related posteriorly to ovarian vessels and at risk of injury during ligation of ovarian vessels
Cardinal ligament or transverse cervical ligament	❖ Cervix to side wall of pelvis	❖ Uterine vessels	❖ Main support of uterus
Round ligament of the uterus	❖ Uterine fundus to labia majora	❖	❖ Derivative of gubernaculum.
Broad ligament	❖ Uterus, fallopian tubes, and ovaries to pelvic side wall	❖ Ovaries, fallopian tubes, round	

		ligaments of uterus	
Ovarian ligament	❖ Medial pole of ovary to lateral uterus	❖	❖ Derivative of gubernaculum.

NOW LET'S DISCUSS SOME PAPER MCQ's

- Uterus cancer travels to labia majora through which route= round ligament
    - because round ligament attaches labia majora and uterus.
- Intra and extra pelvic extension of ligament= Round ligament of uterus
- Ligament that hold uterus in anteverted position= Round ligament
- The sensory pain fibers to the uterus pass through= Broad Ligament
- Pain fibers to uterus travels via= Broad ligament
- Hematoma in broad ligament= uterine artery
- Broad ligament part attaches with uterine tube is= Mesosalpinx.
- Broad ligament is a double peritoneal membrane. What tubeless structure is present in its anterio-superior portion= Mesosalpinx
- Uterine prolapse most likely = Chronic cervicitis with squamous metaplasia
- Prevent ovaries from falling down= Broad ligament
- Normal decent of ovary occur in early life which support ovary from further descent and remains within pelvis = Uterus (No option of broad ligament if present prefer that)
- Uterus connect with labia majora by= Round ligament.
- Lateral fornix of vagina related to= Ureter
- Gubernaculum remnant in female= Ovarian ligament

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579. **WOMAN WITH LOWER ABDOMINAL DRAGGING PAIN AND URINARY INCONTINENCE. CAUSE, 3RD DEGREE UV PROLAPSE, LIGAMENT DAMAGE IS= UTEROSACRAL LIGAMENT**

KNOW THE DIFFERENCE

- Main support of Pelvic viscera —— levator ani
- Main support of uterus —— transverse cervical ligament (aka cardinal ligament) then broad then uterosacral
- Dynamic support of uterus----------pelvic diaphragm which is made up of levator ani and coccygeus

NOW LET'S DISCUSS SOME PAPER MCQ's

- Main support of uterus= Transverse cervical ligament
- The principal dynamic support of uterus holding it in position is= Pelvic diaphragm
- Cervix at External Os, which structure is damaged= Uterosacral ligament
- Pt. has heaviness n pain in perineum. O/E the external Os in present in introits. This is due to weakness of= Uterosacral ligament
- Which of the following structures take part in formation of Pelvic diaphragm=Levator ani
- Which of the following take part in formation of Pelvic diaphragm= Pubococcygeus. (Part of the levator ani)
    - Note that---sometimes pubococcygeus option is not given prefer puborectalis than

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580. **IN MEDIOLATERAL EPISIOTOMY, WHICH PART AT RISK OF BEING GETTING INJURED=BULBOSPONGIOSUS**

REMEMBER ABOUT EPISIOTOMY

Median	Muscle cut→ Bulbospongiosus, superficial transverse perineal muscles Heals better But increases risk of 3rd/4th degree tears Complication/Risk→ Damage to External anal sphincter---fecal incontinence
Mediolateral	Muscle cut→ Bulbospongiosus, superficial transverse perineal muscles and Levator ani More painful

| Complication/Risk→ Damage to Bulbospongiosus

NOW LET'S DISCUSS SOME PAPER MCQ'S

- A 29-year-old woman is admitted to hospital because the birth of her child is several days overdue. Tearing of the pelvic diaphragm during childbirth leads to paralysis of which of the following muscles=Levator ani
- Muscle cut in episiotomy is=Superior transverse perineal plus Bulbospongiosus
- Obstetrician reluctant for median episiotomy due to risk of=External anal sphincter damage
- During difficult delivery, which of the structure is likely to get paralyzed=Levator anii
- Most likely muscle damage during labour= Levator ani
- In Mediolateral Episiotomy, which part at risk of being getting injured= Bulbospongiosus

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581. **COMMON RELATION OF URETER IS = POST. TO GONADAL VESSELS**

582. **A LADY UNDERGONE C-SECTION. SHE DEVELOPED PAIN IN LUMBER REGION AND ANURIA. CAUSE OF THIS PELVIS CONDITION= URETER LIGATED**

RELATION OF URETER IS

- Anterior to iliac vessels
- Posterior to ovarian (gonadal) vessels
- Ureter is related posteriorly to ovarian vessels and at risk of injury during ligation of ovarian vessels (for this remember the following mnemonic)

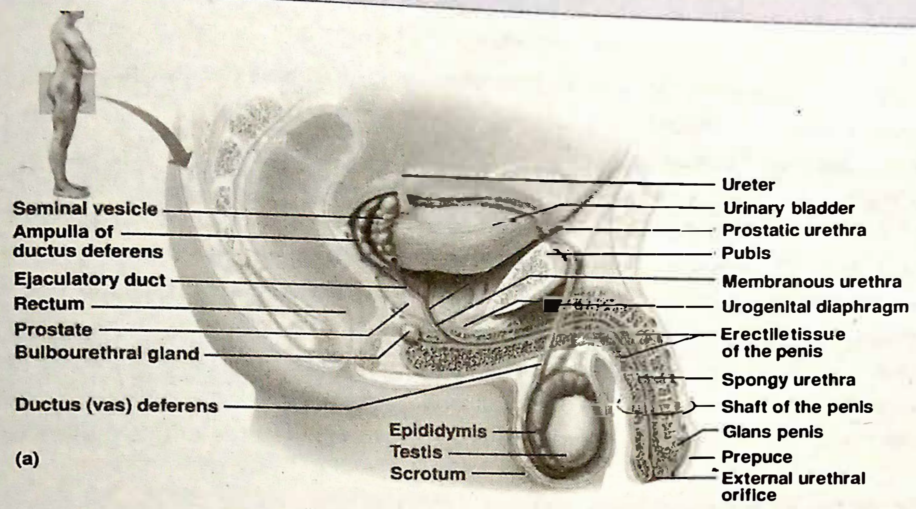
Remember **(mnemonic: water (ureter) under the bridge (ovarian artery)**

NOW LET'S DISCUSS SOME PAPER MCQ'S

- Patient presents with Ureter stone at pelvic brim and is prepared for surgery. The Surgeon uses what demarcation to identify ureter at pelvic brim= Bifurcation of abdominal aorta
    - Note that the aortic bifurcation is the point at which the abdominal aorta bifurcates (forks) into the left and right common iliac arteries
    - During hysterectomy care should be taken about which ureter relations to surrounding= pass behind the broad ligament.
        - It also comes as
            - During hysterectomy, ureter can be damaged at which site= Cardinal ligament >broad ligament > pelvic brim
            - During staging laparotomy of ovarian CA, ovarian artery is ligated near pelvic brim. Which structure is likely to be damaged= Ureter
            - At pelvic brim, ureter gets damaged while ligating= Ovarian (if ovarian is not in option choose uterine artery---ovarian vessels > uterine vessels)
- The most common site of lodging of a ureteric stone is = Pelvic brim
- Female patient after operated for fibroid in uterus. Within 24 hours develop lumber pain due to damage to= Ureter
- A 35-year female had an abortion at home done by a Dai. She develops few weeks later a pelvic mass. O/E hematoma in broad ligament is found. Injury to which of the following leads to hematoma formation= Uterine artery
- Which crosses ureter anteriorly= Uterine artery
    - This also come as
        - Uterine artery after arising from internal iliac crosses above= Ureter
        - Which structure is crossed by uterine artery before supplying uterus= Ureter
    - Note that

- The uterine artery usually arises from the anterior division of the internal iliac artery. It travels to the uterus, crossing the ureter anteriorly, to the uterus by traveling in the cardinal ligament.

583. STRUCTURE FROM LATERAL TO MEDIAL IF VIEWED FROM POSTERIOR SIDE OF URINARY BLADDER= URETER, SEMINAL VESICLE, AMPULLA OF DUCTUS DEFERENS


Seminal vesicle
Ampulla of ductus deferens
Ejaculatory duct
Rectum
Prostate
Bulbourethral gland
Ductus (vas) deferens
(a)
Epididymis
Testis
Scrotum
Ureter
Urinary bladder
Prostatic urethra
Pubis
Membranous urethra
Urogenital diaphragm
Erectile tissue of the penis
Spongy urethra
Shaft of the penis
Glans penis
Prepuce
External urethral orifice

584. MOST COMMON SITE OF LODGING OF URETERIC STONE IS= VESICOURETERIC JUNCTION

REMEMBER URETER CONSTRICTION OCCURS AT

- ❖ Where renal pelvis joins ureter
- ❖ Where it crosses pelvis brim
- ❖ Where it enters bladder

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ Most common site of lodging of ureteric stone= vesicoureteric junction
- ❖ young child has unilateral hydronephrosis, most likely obstruction in= stone in pelviureteric junction (Ureteropelvic junction)
- ❖ Ureter narrowest at= vesicoureteric junction
- ❖ Young male, the site where stone gets stuck most in ureter is= vesicoureteric junction

585. LEAST COMMON SITE FOR ECTOPIC PREGNANCY WOULD BE AT = OVARIES (CERVIX>OVARIES)

- ❖ While Most common site of ectopic pregnancy and fertilization= Ampullary region of Uterine tube (that is widest part of the Fallopian tube).

586. PT IN LABOUR FOR 2 HOURS. ON PV INVERTED SPINES, NARROW SUB-PUBIC ARCH AND SACRAL PROMONTORY NOT REACHABLE TYPE OF PELVIS= ANDROID

REMEMBER ABOUT TYPE OF FEMALE PELVIS

	Gynecoid	Anthropoid	Android	Platypelloid
Transverse diameter	Wide	Narrow		
AP diameter	Narrow	Wide		Narrow
Subpubic arch (Pelvic outlet)	Wide		Narrow	Wide

Additional points	Most common overall Most favorable for delivery	Narrow ischial spines Much more common in black women	Male type pelvis Pelvic brim is triangular Prominent ischial spines	Pelvic brim is transverse kidney shape Flattened gynecoid shape

NOW LET'S PRACTICE SOME PAPER MCQ'S

- In which of the following pelvis, AP diameter is more than transverse= Anthropoid
- Types of pelvis in males= Android
    - It also comes as "with two options"--then
        - Male type of pelvis is= Android + Anthropoid
- Long AP and short transverse diameter and inverted ischial spine. Which type of pelvis is this= Anthropoid
- Primigravida in labor not delivering, senior obstetrician examines her per-vaginally and noted prominent ischial spines, narrow subpubic angle, her finger could not reach sacral promontory. What is the best term to define this condition= Android pelvis
- The type of pelvis in which transverse diameter is more than anteroposterior is called as=Gynaecoid
- The plane from the sacral promontory to the inner posterior surface of the pubic symphysis is an important dimension of the pelvis for normal delivery. What is the name of this plane= Obstetric conjugate
- Best pelvis for delivery= Subpubic angle > 90
    - It also comes as
        - Which feature of a pelvis favors for normal delivery=Subpubic angle > 90

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587. RT. TESTICULAR VEIN ENTER = IVC.

TRIBUTARIES OF INFERIOR VENA CAVA CAN BE SIMPLE UNDERSTAND AS

- Rt. Testicular vein, Rt. ovarian vein, Rt. renal vein, Rt. suprarenal vein enters= IVC.
- While Lt. Testicular vein, Lt. ovarian vein, Lt. suprarenal vein enters=left renal vein

Note that

- Left renal vein is longer than right renal vein
- Because the aorta is in the way, the left renal vein has to pass in front of aorta it to get to the IVC
- And left renal vein is posterior to pancreas

Also note that

- Spread of renal tumor will be through= renal vein
- Renal veins lie anterior to renal arteries

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Rt. Testicular vein enter = IVC.
- Left testicular vein enter into= left renal vein
- Right ovarian vein drains into= IVC
- Right renal vein drains into=IVC
- Right supra renal vein drains into= IVC
- Left suprarenal vein drains in to= Left renal vein
- Regarding supply of suprarenal gland= Left suprarenal goes to left renal vein
- Anterior to Left renal vein is=SMA
- Relation of left renal vein= Anterior to aorta
- Which structure lies anterior to inferior vena cava-=Right gonadal vessel
- Which one does not end in IVC = Left suprarenal vein
- Which crosses in front of abdominal aorta= Left renal vein
- PG afraid of doing adrenalectomy on Rt side due to fair of damage to= IVC

- Internee Surgeon performing B/L adrenalectomy. HOD refuses to give him right adrenalectomy due to risk of damage to which structure= IVC
- A post adrenalectomy pt dies 4 days after the surgery. What is the most likely cause= Deficiency of aldosterone
- What is more appropriate= Renal vein anterior to renal artery
- About kidney= Covered by facial sheath along with adrenal gland
- Vessel passing in front of inferior vena cava= Right testicular artery
- Relation anterior to hilum of the right kidney is=Second part of duodenum
- The 2 kidneys are differentiated from each other by=Structures at hilum

588. NARROWEST POINT IN PEDIATRIC AIRWAY= CRICOID

REMEMBER

- In males' narrowest part of urethra is= External urethral meatus
    - Note that External urethral meatus is the narrowest part, 2nd being the membranous part
- Least distensible part of urethra = membranous
- Most distensible part of urethra = prostatic urethra
- Esophagus narrowest at = Cricopharyngeus
- Size of ureter= 25 cm

NOW LET'S PRACTICE SOME PAPER MCQ'S

- The Narrowest part of male urethra is= External meatus
- Least dilatable part of male urethra is= Membranous urethra
- A doctor while passing urinary catheter notice that part of urethra is least distensible/dilatable. Which part is this= Membranous part
- 3 years old child with flank pain. On ultrasound there is Unilateral Hydronephrosis. Cause is= Constriction at PUJ
- A boy with history of fall while cycling, presented to ER 2 days later with complaints of anuria. Most likely the lesion is in=Urethra
- Regarding Female urethra=Prone to infection
- Neck of the female urethra lies=Upper surface of urogenital diaphragm
- Neck of bladder and proximal urethra is supplied by=sympathetic L1-L2 via hypogastric plexus
- A urologist doing transurethral surgery, 2 arteries at 5 and 7 o clock came in his way which block his way to operate and can't see further. What is the exact name of the artery=Badenoch's artery

CHAPTER # 23

SPINAL CORD AND GENERAL

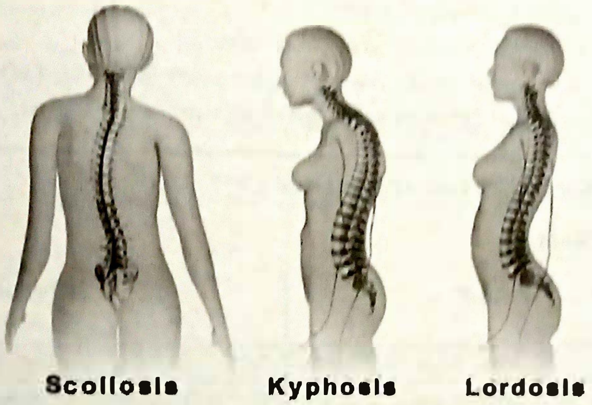
589. VERTEBRAL COLUMN CURVATURE TO SIDE IS CALLED= SCOLIOSIS

ALSO REMEMBER

- Lordosis: the spine curves significantly inward at the lower back
- Kyphosis. Characterized by an abnormally rounded upper back (more than 50 degrees of curvature).
- Scoliosis. Characterized by sideways curve to their spine.

ALSO NOTE THAT

- Kyphosis or Kyphotic Curve= Concave anteriorly and convex posteriorly
- Lordosis or Lordotic Curve= Convex anteriorly and concave posteriorly



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590. THE ADJACENT LAMINAE OF THE VERTEBRAE ARE JOINED TOGETHER BY= LIGAMENTUM FLAVUM

KNOW THE DIFFERENCE

- Pt with Hyper flexion of neck. Ligament damaged is= Posterior longitudinal
- Extreme extension (hyperextension) of the neck is prevented by which ligament=Anterior longitudinal ligament
- The ligament which holds the dens of the axis against the anterior arch of the atlas is the= Transverse ligament
- Vertebral body are limited by= Anterior and posterior longitudinal ligaments
- Vertebrae are held in position by which ligament= Anterior and posterior longitudinal ligament
- Vertebrae are joined to the adjacent laminae of the vertebrae together by= Ligamentum flavum

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591. FEATURE OF C1 VERTEBRA = LACKS VERTEBRAL BODY

NOTE:

- C1 vertebrae (atlas) → no body, no spine
- C2 vertebrae (axis) → peglike odontoid process
- C7 vertebrae → longest spine
- Thoracic vertebrae → heart shaped
- Lumbar vertebrae → kidney shaped

ALSO NOTE THAT

- Damage to first lumbar vertebra will lead to = Conus Medularis Syndrome

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Characteristics of C7 vertebrae= C7 has longest spine
- Person died after RTA due damage to the spinal cord by a broken piece of vertebrae. Which of the following vertebrae is it to be likely= Axis
- What is absent in atlas (C1) = Body
- Atlas vertebra does not have= Spinous process
- Second vertebrae are different as it has= Odontoid process
- In embryonic period, which vertebrae forms the body of above vertebrae= C2
- L-1 Vertebrae fractured, damage to which structure= Conus Medularis
- Regarding C2 vertebrae which is true= Contains odontoid process
- Type of joint between vertebrae= Symphysis
    - It also comes as
        - Intervertebral disc is a type of which joint= Symphysis
- Lumbar vertebrae give attachment to= Extensors

ALSO NOTE THESE MCQS ABOUT SPINAL CORD/VERTEBRAL COLUM

- Blood supply of spinal cord is by=Spinal artery
- Regarding spinal nerve=Formed in intervertebral foramina
- Regarding new born, on horizontal section which is correct=C shaped vertebral column concave inside
- Female pelvis tilted on vertebral column in which direction= Forwards

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592. TRANSPYLORIC PLANE IS LOCATED AT = LOWER BORDER OF L1

ALSO REMEMBER SOME OTHER LANDMARKS

Vertebral Level	Landmark	Internal Significance
C3	Hyoid bone	
C4	Superior border of thyroid cartilage	❖ Bifurcation of common carotid artery
C6	Cricoid cartilage	❖ Larynx ends; trachea begins ❖ Pharynx ends; esophagus begins ❖ Inferior laryngeal nerve enters the larynx.
C7	Vertebra prominence	❖ Isthmus of thyroid gland
T1	Sternoclavicular joint	❖ Highest point of apex of lung.
T2	Jugular notch	❖
T4	Sternal angle (of Louis)	❖ Division between superior and inferior mediastinum ❖ Ascending aorta ends ❖ Arch of aorta begins & ends ❖ Descending aorta begins ❖ Bifurcation of Trachea
T8		❖ Inferior vena cava passes through diaphragm
T10		❖ Esophagus through diaphragm
T12		❖ Aortic opeining---Aorta through diaphragm ❖ Thoracic duct through diaphragm ❖ Azygous V. through diaphragm
L1	Transpyloric plane	❖ Pylorus of stomach. ❖ Duodenojejunal flexure ❖ Origin of Superior Mesenteric artery ❖ Coccygeal ligament starts ❖ Spinal cord termination in adults
L2		❖ Cisterna chyli ends ❖ Thoracic duct begins ❖ Azygous and Hemiazygous begin

L3		❖ Spinal cord termination in childrens ❖ Conus medularis in childrens
L4/L5	Iliac crest	❖ Bifurcation of aorta into common iliac arteries ❖ Inferior vena cava formed from common iliac veins ❖ Site for lumbar puncture
S2		❖ Dura, arachnoid, Subarachnoid space ends

NOW LET'S SOLVE SOME PAPER MCQ'S

TRACHEA

- Site of tracheostomy in adult= C2, 3 (if you have to choose one then prefer C2)
- An adult pt after accident due to trauma in face and mandible required Tracheostomy. Site for tracheostomy should be= C2-C3
- Level at which trachea starts=C6
- Trachea bifurcates at level of=T4-T5
    - It also comes as
        - Bifurcation of Trachea at vertebral Level of=T4

AORTA

- Descending aorta arises from= T4
- Thoracic Aorta starts at the level of=T4
- Aorta opening in diaphragm= T12
- Aorta=Origin of renal artery from L2
- At which level does aorta give off bronchial arteries=T5-T6
- Bronchial arteries emerge from descending aorta at level of=T5-T6
- The artery of Adamkiewicz most frequently arises from the aorta at which spinal level=T9-T11

OTHERS

- Xiphoid process is present at which vertebral level=T9
    - It also comes as
        - Xiphisternum is at the vertebral level of=T9
- Trans pyloric plane=Origin of SMA at L1
    - It also comes as
        - Trans pyloric plane lies at which level= Lower border of L1
- Body of hyoid bone lies at which level in erect position= C3
- C.T. scan done at L1 level shows= Superior mesenteric artery
    - It also comes as
        - CT scan at L1 region shows which of the following structures= Superior mesenteric leaves aorta
- Esophagus-gastric junction at level of=t11
- Lt Kidney hilum level=L2
- Superior mesenteric artery leaves aorta at level of=L1
- Pulsating abdominal mass (abdominal aortic aneurysm). Most common site is= T12
- Landmark for pudendal nerve block= Ischial spine
- Isthmus of thyroid gland=2nd, 3rd and 4th tracheal rings
- Common Carotid = C4
- Upper level of anterior superior iliac crest= L4
- IVC bifurcates at the level of=L5
- L1 and L2 ends at=Inferior hypogastric plexus
- Oblique fissure of the lung at level = T3 to T6 Costochondral.
- Tip of scapula at body level of = T7 body

- Bifurcation of common carotid artery occurs at–The upper border of thyroid cartilage

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593. **AFTER A GUNSHOT INJURY TO SPINAL CORD, MAN FINDS EXTENSION AT KNEE DIFFICULT. O/E EXTENSOR MUSCLES OF KNEE ARE PARALYZED. WHICH SPINAL CORD SEGMENTS ARE MOST LIKELY TO BE INVOLVED= L2 L3**

NOTE THE IMPORTANT DERMATOMES

Area	Dermatome
Great Toe	L4
Little Toe	S1
Thumb	C6
Ring and little fingers	C8 (also T1 for little finger)
Clavicle	C3
Umbilicus	T10
level of nipples	T4
Knee	L4
Perineum	S2, S3, S4

NOW LET'S SOLVE SOME PAPER MCQ'S

- Dermatome of thumb= C6
- Tingling sensation on thumb in general anesthesia. Dermatome involved is= C6
- Cervical enlargement extends from = C5 to T1
- Dermatome of lateral side of wrist is= C6
- L4 dermatome= Knee
- Sensory supply of neck from chin to supraclavicular notch= C3, C4
- In Perineal region, dermatome involved is= S3 – S4
- Dermatome present on lateral side of the foot is=S1
- Back pain and pain in the medial calf and medial malleolus. dermatome involved= L4
- Sensory changes in a specific dermatome by a herniated intervertebral disc is due to compression on the=Spinal nerve or posterior root

CLAVICLE AND STERNAL ANGLE

- Dermatome was asked from lower end of clavicle to sternal angle= C3-C4
- Pt has rash and Pruritis below clavicle and above sternal angle dermatome involved=C3, C4
- Dermatome below clavicle but above sternoclavicular joint=C3-C4

UMBILICUS

- In pain around the umbilicus, which dermatome is involved=T10
- Dermatome distribution around umbilicus is at the spinal level of= T10

MYOTOME

- After a gunshot injury to spinal cord, man finds extension at knee difficult. O/E extensor muscles of knee are paralyzed. Which spinal cord segments are most likely to be involved= L2 L3
    - There is a difference between Myotome and dermatome
    - A myotome is the group of muscles that a single spinal nerve innervates
    - Similarly, a dermatome is an area of skin that a single nerve innervates
    - Myotome examples are
        - C1/C2: neck flexion/extension
        - C6: elbow flexion
        - C7: elbow extension/wrist flexion/finger extension
        - L2: hip flexion

- L3: knee extension
- S2: knee flexion

594. PAIN IS REFERRED TO SHOULDER BY= C3, 4, 5

Pain area	Referred pain	Dermatome
Appendicitis	Umbilical region	T10
Angina pectoris	Arm, Jaw	
Aortic aneurysm	Back	
Diaphragm, gall bladder	Shoulder (phrenic nerve c2, c3, c4)	
Pancreatitis	Back	

NOW LET'S SOLVE SOME PAPER MCQ'S

- Vague initial referred pain from appendicitis= umbilicus
- Referred pain of Appendix to= T10
- Back pain and pain in the medial calf and medial malleolus. dermatome involved= L4
- About phrenic nerve= When irritated patient feels pain at tip of shoulder
- A 22 yr old student complains of pain on studying. Which nerve should be cut to relieve pain=C2
- In case of Irritation in diaphragm, pain referred to= Shoulder and neck
- Pain to tip of shoulder carried via= C3 C4 C5
- Shoulder pain referred from=Gall bladder
- Pain of diaphragm referred to= Tip of shoulder
- Gall bladder pain is referred to tip of shoulder via=Parietal peritoneum sensation of cervical dermatome

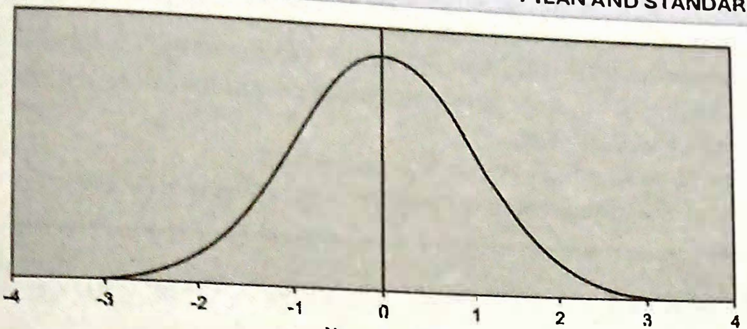
595. PT HAD AN RTA INJURY AT THE LEVEL OF T10. O/E HE WAS PALE AND HYPOTENSIVE. ORGAN LIKELY DAMAGED IS=SPLEEN

ALSO NOTE THESE MCQS

- Which one of the following synapses in aorticorenal ganglion=T9-T11
- During lumber sympathectomy which ganglion is saved=L1
- Right crus of diaphragm Arises from=L1, L2, L3
- Ptosis after trauma, lesion at which site=T1-T4
- A pt comes to you with complain of numbness of medial arm and atrophy of small muscles of hand. Most likely it is due to=Cervical rib
- Accessory cervical rib causing numbness and pain in the hand is associated with compression of which part of brachial plexus at its origin=T1
- A person died in RTA. On post-mortem examination a spine was found crossing cervical spinal cord which vertebra it could be=C7

PUBLIC HEALTH SCIENCE AND GENERAL

596. **THE SHAPE OF NORMAL DISTRIBUTION CURVE IS BASED MAINLY ON= MEAN AND STANDARD DEVIATION**



Normal curve

REMEMBER

- Standard deviation = how much variability exists in a set of values, around the mean of these values.
- Normal curve is smooth, bell-shaped symmetrical curve with
    - Total area under curve = 1
    - Mean of curve = 0
    - Standard deviation = 1
    - Mean, Median and Mode coincide.
    - Normal standard deviation has variance = 1
    - Standard deviation is a measure of deviation from mean.
- A graph representing the density function of the Normal probability distribution is also known as a Normal Curve or a Bell Curve
- To draw such a curve, one needs to specify two parameters, the mean and the standard deviation
- The graph above has a mean of zero and a standard deviation of 1
    - 1SD = 68% of values
    - 2SD = 95% of values
    - 3SD = 99.7% of values

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Standard deviation measures which of the following= variability
- Why we plot standard deviation with mean on graph=Variability in data
- Standard deviation=Difference of mean
- One standard deviation means=Both side of mean in normal distribution curve
- While analysing biological data obtained from a sample, Standard Deviation (S.D.) is calculated along with the mean because it indicates the= Variability amongst individual observations
- One standard deviation= Lies on both sides of the mean in a normal distribution curve
- The Square root of variance is=Standard deviation
- True regarding standard deviation is=Statistic that measures the dispersion of a data set relative to its mean on either side.
- Measures of dispersion are=Variance and standard deviation
- The primary use of the standard error of the mean is in calculating the=Confidence interval

KNOW THE DIFFERENCE.

- Confidence interval represents=Mean and its standard error

- ❖ Confidence limit represents=Standard error of mean plus T value

ALSO NOTE THESE

- ❖ On a study about diabetes between 2 groups it was found, women with mean 200±50, Men with mean 205±10, this means= Man with high median and low standard deviation
- ❖ Data on 2 groups of diabetics was collected to look at the male female pattern of diabetes. Female had a mean RBS of 200 +/- 50mg% and males had a mean RBS level of 205 +/- 10mg. The results reveal that= Women more variability of RBS in their group
- ❖ Diastolic blood pressure is distributed normally in a group of lady teachers (N=75). Mean was 80mmhg and standard deviation of 10. Approximately what percentages of teachers have a diastolic blood pressure of 70mm or greater= 84%
- ❖ p value of a drug will be significant if it is less than=0.05
- ❖ For significant difference the p value of drug should be less then= 0.05

596.

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597. A TEST WHICH EXCLUDED NON AFFECTED PATIENTS COMPLETELY= SPECIFICITY

REMEMBER

Positive Predictive Value	The probability that a patient with a ⊕ test result truly has the disease.
Negative Predictive Value	The probability that a patient with a ⊖ test result truly does not have the disease
Sensitivity	The ability of the test to identify the disease in those who have it
Specificity	The ability of the test to exclude the disease in the absence of the disease

NOW LET'S PRACTICE SOME PAPER MCQ'S

- ❖ A test which has true positive property= Sensitivity
  - ○ Know the difference.
    - ▪ True positivity is sensitivity.
    - ▪ True negativity is specificity.
- ❖ Ability of a test to rule out disease is known as= Specificity
- ❖ Which test rules out the non-diseased= Specificity
- ❖ Progression of disease is best studied by= Predictive values
- ❖ Regarding Positive predicted value= Find positive true in positive patient.
  - ○ It also comes as
    - ▪ Positive predictive value= Positive among positive
    - ▪ Positive predictive value is= Proportion of true positive in all positive
- ❖ On follow up, progression of disease is estimated by= Predictive validity
- ❖ What effects the positive predictive value= Prevalence
- ❖ When a test is performed in disease person and person is positive for that then the test is=True positive

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598. PREVALENCE IS = ALL CASES

NOTE THAT

- ○ PrevAlence: All cases (old & new)
- ○ Incidence = new cases (Incidents)

NOW LET'S DISCUSS SOME PAPER MCQ'S

- ❖ Incidence definition= No of New cases
- ❖ What is prevalence= Total number of cases new and old at a point in time

- In a population, a group of people with a particular feature are represented by= Occurrence
- Incidence means= New cases over specific time
- Positive predictive value associated with= Prevalence of disease
- On follow up, progression of disease is estimated by= Predictive validity
- A lady with Ca cervix suspicion. Which investigation is 96% specific and cost effective= PAP smear

599. DATA IS COLLECTED FOR SOME CLINICAL TRIAL BASED ON PRESENCE OR ABSENCE OF VOMITING. WHAT TYPE OF DATA IT IS = NOMINAL

REMEMBER

- Nominal data→ is choosing between two/three variables e.g. presence or absence, man or women, north or south, black or brown
- Ordinal data→ is what is in order like Primary > Secondary > Tertiary, one more example like Happy > Unhappy > Very Unhappy.
- Ratio scale→ has the property of equal intervals but also has a true 0 point. As a result, one can multiply and divide as well as add and subtract using ratio scale e.g. distance and length (cm, km) etc.
- Interval Scales→ The interval between adjacent values—like 1^{ST} horse, 2^{ND} horse etc.

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Vomiting absent and present. Type of data= Nominal
- What type of data in ASA (American Society of Anesthesiologists) classification= Ordinal
- If observation given of some location and within a scale of measurement is known as= Ratio

600. DOCTOR PATIENT RELATIONSHIP = ACTIVE LISTENING TO EVERY QUESTION OF PATIENT

ALL QUESTIONS TILL DATE FOR ETHICS AND COUNSELLING

- Breaking bad news = Information in crisp and separate formal session
    - It also comes as
        - An admitted patient has been diagnosed with a fatal disease. What should the physician do next= Give clear and crisp evidence knowledge diagnostic based for his benefit
        - Fatal disease of patient= Crisp clear information should be provided to the patient according to his needs
        - A bad news about a clinical situation should be ideally provided=By the treating doctor in a formal session in a setting of exclusivity.
- Social support to patient is provided by= Family members
- Counselling= done for patients to help themselves
    - Good counselling helps= Patient
    - Counselling is a technique, which when applied, enables patients to help= Themselves
- Best way to avoid complication of procedure/intervention is= Remain in own competence limit
- Seductive female pt came near to you, what you will do= Call in nurse
    - It also comes as
        - A female patient comes to the doctor's clinic wearing revealing clothes. She comes up very close to the doctor and starts asking him personal questions in a seductive tone. What would be the appropriate response by the doctor= Call in a nurse
- In emergency department= Psychological support of the patient and the family / accompanying relatives must be ensured
- 40 years Diabetic has Problems in bed with wife. Next step to take is= Ask the pt what kind of bed problem they are having
- An old patient in a cardiology clinic complains about the receptionist behavior. Though staff and other patients are happy with the receptionist. What will you do= Apologize and offer that i will talk to the receptionist
- Best example of psychological stress= Financial crisis

- The best strategy for a female wanting to lose weight is=Self-monitoring
- A doctor is good if he is= respects pt decision regarding treatment
- A normal and healthy individual is he who=Eats, sleeps, and exercises regularly and lead a disciplined life
- Patient has intractable long history of pain and has taken various painkillers. How do you treat the patient=Psychological cognitive treatment
- On serology a patient is HIV positive. What will be the next step=Confirm by performing other tests
- What step for prevention must be taken in ICU=Frequent hand cleaning.
- A patient is post op in ICU, he needs mechanical ventilator for respiratory support the patients is anxious about it, how will u go further while providing this mechanical ventilator to the patient=Explain the need and importance of ventilator to the patient
- How to access the compliance of patient therapy= Patient perception of severity of disease and effects after not using the drug
- When a person is talking to a patient, listening to the tone and the speech of the patient may have impact and this is called= Attending and listening
- Definition of sickness= Sense of one not feeling well
- On initial patient interview, least likely thing to be done is= Project an image of authority
- You are performing a medical interview with a patient and having some difficulty obtaining accurate information regarding the events that brought him into the office. Which of the following physician communication tactics leads to the collection of the most accurate information= Using open-ended questions
- A 30-year woman in Azad Kashmir was injured mildly in an earthquake that killed many people apart from her distant uncle. She would most probably be in=Situational crisis

ABOUT PHARMA COMPANY

- A pharmaceutical company offer a trip to foreign country with family, and says there is a discussion panel about their new product. What should a physician do=Refuse politely
- Which of the following statements best describes the ethical implications of a doctor being offered by a pharmaceutical company to appear on a TV show promoting a drug=It is in line with medical ethics as long as the doctor discloses any conflicts of interest.
- Regarding Doctor and pharmaceutical company relation, which is correct=Pool resources together for betterment of health institution

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601. FOUR BASIC PILLARS OF MEDICAL ETHICS= AUTONOMY, JUSTICE, BENEFICENCE, NON-MALEFICENCE

NOTE

- Autonomy--- Honoring patient preferences, informed consent and confidentiality
- Beneficence --- acting in patient's best interest, even if it conflicts with autonomy.
- Nonmaleficence --- about avoiding harm
- Justice -----involves fair distribution of healthcare resources.

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Medical ethics= Moral code of conduct of doctor
- A young female patient with psychiatric illness recovering with oral medications. Her aunt out of curiosity calls her psychiatrist inquire about her disease and the Doctor denies to give any information. He is maintaining which aspect of medical ethics=Confidentiality
- Confidentiality can be breached = If patient authorizes you
    - It also comes as
        - The most important component of Hippocratic oath is=Confidentiality
- Doctor patient confidentiality breach may apply in which of the following situation= A young Women having suicidal thoughts

- A female diagnosed with grade 4 Ca ovaries. The patient requests the doctor not inform her family about her condition and severity. The family has now come in follow up to know about her disease. What shall be the next step to be taken= Tell nothing to the family
- A patient was diagnosed with pancreatic cancer. A doctor on his way to the hall, bumps into the patient's brother who requests to not share this news with the patient as he wouldn't tolerate it which will make his treatment difficult. He informed that they are planning a family discussion in a few days to disclose the news. What shall the doctor do in this situation=Tell his brother that it will be dishonesty with patient, family and medical staff working for his treatment
- A nine year old girl who has terminal illness asks the physician, "Am I going to die?" the child's parents previously told the doctor that they do not want to the child to know her diagnosis or prognosis. The doctor's best response to the child's question would be=. "Tell me what your parents have told you about your illness."
- A 77 years old male complaining of abdominal pain reports to the emergency department with his wife. A mini-mental state examination reveals pronounced forgetfulness and disorientation. His physical examination and investigation suggests a diagnosis of acute appendicitis requiring immediate surgery. However the patient is unable to understand and give informed consent. What should the doctor do= Obtain consent form his wife to perform surgery
- During a session of history taking, a patient told the house-officer that he had no plans of disclosing his HIV-positive status to his wife and requested the doctor to keep this information confidential. Which of the following actions is in line with the medical ethics=Persuade the patient to disclose this information to his spouse in the absence of which the doctor should do so.

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602. THE BEST QUALITY OF DOCTOR TO REACH AT POSSIBLE DIAGNOSIS IS= GOOD LISTENING

GOOD DOCTOR AND PATIENT MCQs

- Doctor can practice effective management by= By good communication
- In a Doctor Patient relationship, what is most important= Mutual trust
    - It also comes as
        - Dr. Patient relationship, first and foremost is= Mutual trust
- A mutual trust can develop in doctor patient relationship when the doctor shows= Honest behaviors with truth telling
- Good Doctor patient relationship requires= Active listening to every question of patient
    - It also comes as
        - The factor that can best improve the communication between a patient and his doctor is=Active listening
        - Regarding good ethics of doctor= Active listening
- The most common cause of lack of communication and understanding between doctor and patient is=Hurried approach with casual attitude
- The professionalism in doctor can be best assessed by= Recording his or her punctuality, conscientiousness, integrity and availability to patients.
    - It also comes with different options.
        - What is meant by professionalism of a doctor= Politeness and good bedside manners
- Doctor recognized by= politeness and good bedside manners

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603. STUDY OF PATIENTS WITH DISEASED OR WITHOUT DISEASE TO IDENTIFY THE RISK FACTORS IN DISEASED= CASE CONTROL

KNOW ABOUT OBSERVATIONAL STUDIES

- Disease vs non disease + History of risk factors= case control----(Shows What happened)
- Risk vs disease (frequency of disease and Risk factors) =cross sectional—(Shows What's happening)
- Exposed vs non-exposed to a risk factor = cohort
- Compares therapeutic benefit of 2 or more treatment or treatment vs placebo= Clinical trial

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Study b/w disease and non-disease and looking into their history for risk factor exposure= case control
- Patient diseased or not, studied for risk factors whether they developed disease or not= case control
- Study of patient with or without disease to identify presence of risk factor in disease= cross sectional
- A Researcher testing efficacy of Penicillin and cephalosporins for streptococcal infection. These drugs are prescribed randomly to 02 groups of patients A & B. What type of study it is= Randomized Control Trial
- Cohort study= Exposure vs non exposure
- Study in pregnant ladies with hx of smoking and effects on their babies= Prospective cohort
- Study was done on women who used to drink alcohol during antenatal care to study the effects of alcohol on baby weight. This type of study is this known as= Prospective study
- An observation study in order to find out disease in future for specific group in specific time is called= Cohort
- Which among the following is observational study=Cohort
- Cohort study= It can be retrospective.
- Two groups one with CHD and associated risk factor is compared to another group with CHD but no associated risk factor. What type of study is it=Case control
- One of the following is an example of observational study= Cohort study
- A study which is carried out by assembling a group of individuals who have been 'exposed' to a medication, risk factor, or some agent and comparing this group to a control group of patients who have not been exposed, followed longitudinally over time, is called= Cohort study
- A surgeon wished to compare the surgical and dietary treatment of hemorrhoids. He randomly included 100 hemorrhoids patients for surgery and 100 for the diet group (high fiber diet) twelve months later he questioned both groups about the persistance or recurrence of pain &amp; inflammation. A significantly higher proportion of surgical patients reported symptomatic relief P &lt; 0.01. This study is an example of=Randomized controlled clinical trial
- Data from a smaller study on 1 group of people is combined with data from a larger study. this type of data is=Meta-analysis
- A surgeon treats 200 patients of hemorrhoids. He randomly divides the patient into surgically and pharmacologically treated groups. After a year he reassess the patients and finds the surgically treated patients to have better outcome. This type of a study is called=Randomized control trials
- In medical research some doctors comparing two group of people and checking the relation of a disease with its risk factors. Which type of study=Cross sectional analysis
- The type of study involved to rule out causes of rare disease is=Case control
- New antihypertensive drug is going to be tested by which technique=Sequential trial
- For assessing the risk of smoking for heart disease, 500 coronary heart disease (CHD) patients were asked if they smoke or not. The 500 healthy friends with similar age, sex and socio-economic background were also asked about their smoking habits. The result revealed that smoking is a risk factor for CH This is an example of= Case control study
- A study was done to determine the importance of smoking as risk factor for development of lung cancer. 500 smokers with disease and 500 healthy matched nonsmokers were evaluated. The type of study is known as=Cohort
- A group with CHD and associated risk factors is compared to another group with CHD but no associated risk factors. What type of study is this=Case control
- A team of professionals, for the research purpose, selected smoker people and divides as group A and group B, after some time, group A people diagnosed with bronchogenic carcinoma, there are chances of development of carcinoma in the other group also, this type of study is called=Cohort study
- Pregnant lady smoker antenatal study done to see effects on baby's weight=prospective
- Data from smaller study on one group of people is combined with data from larger study. what type of data is this= Meta-analysis

- A therapist has selected a group of 40 smokers for smoking cessation therapy. Among 40, he selected only 20 smokers for the therapy. After 6 months' he gave an assessment of all 40 smokers. What key component is missing= Construction error

604. CORRELATION OF TWO THINGS BY WHICH TEST = STUDENT T TEST

STATISTICAL TESTS

t- test.	❖ Checks differences between means of 2 groups	❖ Tea is meant for 2. ❖ Example: comparing the mean blood pressure between men and women
ANOVA	❖ Checks differences between means of 3 or more groups.	❖ 3 words: ANalysis Of VAriance. ❖ Example: comparing the mean blood pressure ❖ between members of 3 different ethnic groups
Chi-square (χ^2)	❖ Checks differences between 2 or more percentages or proportions of categorical outcomes (not mean values).	❖ Pronounce Chi-tegorical. ❖ Example: comparing the percentage of members ❖ of 3 different ethnic groups who have essential ❖ hypertension
Regression analysis	❖ Regression analysis is a way of mathematically sorting out which of those variables does indeed have an impact.	❖ It answers the questions: Which factors matter most? Which can we ignore? How do those factors Interact with each other? And, perhaps most importantly, how certain are we about all of these factors?

NOW LET'S PRACTICE SOME PAPER MCQ'S

- Chi square= 2 by 2 table
- The following test is applicable when results of an investigation are presented in a fourfold table or a 2 x 2 contingency table=Chi square test
- Most suitable test for categorical data= Chi square
- Study comparing values= Chi square test
- Chi square is used to measure= Statistical analysis
- A student wanted to study Relationship between increases in Temperature and duration of surgery, to evaluate results which statistical Test he should apply= Regression Analysis
- Study done between duration of surgery and temperature change= Regression analysis
- Bias study= sample error
- In a study, 40% women received HRT and 20% didn't. The best way to represent such study is= Pie chart
- From a population 2 groups are selected on age basis and then subgroups assigned randomly for study purpose. What type of sampling is this= Random stratified sampling
- The difference between the mean of 2 groups is determined by= T-test
- T test is used=To compare 2 categories/groups
- Kaplan- Meier curve is used for= Survival of patients
- In statistics universe means=Population

605. A GYNECOLOGIST IS COMPARING THE EFFICACY OF TWO DIFFERENT DRUGS IN TREATING UTI. NORFLOXACIN AND AMOXICILLIN WITHOUT MENTIONING THE NAMES OF THE DRUGS, GROUP A IS GIVEN NORFLOXACIN AND GROUP B IS GIVEN AMOXICILLIN. THE TYPE OF STUDY MOST LIKELY IS= SINGLE BLIND

KNOW THAT

- Single-blind: In a single-blind study, only the participants are unaware of which group they are in (receiving the treatment or a control). The researchers conducting the study know.

- Double-blind: In a double-blind study, both the participants and the researchers conducting the study are unaware of which group participants belong to. This is done to minimize bias that could influence how the study is conducted or interpreted.

NOW LET'S PRACTICE SOME PAPER MCQ'S

- In statistics, most accurate is= Single blind subject doesn't know whether placebo or drug is given
- True about clinical trial is= Single blind study subject doesn't know which is placebo or drug
- Drugs known to physician classed as A and B, given to pts. Randomly, is= Single blind
- What is random sampling used for= Selecting a representative sample from a population
- In a study, a population was divided into subgroups based on age and from each subgroup the samples were taken randomly. Such sampling is known as= Stratified random sampling

606. IN NORMAL DISTRIBUTION CURVE= MEAN, MODE, MEDIAN COINCIDE

NOTE

Mean	Is equal to $\frac{sum\ of\ values}{total\ number\ of\ values}$
Median	Middle value of a list of data when arranged in ascending order But if there even are number of values, the median will be the average of the middle two values
Mode	Most common value, if no number in the list is repeated, then there is no mode for the list.

NOW LET'S PRACTICE SOME PAPER MCQ'S

- A study in conducted to on rates on antibiotics of same effect produced by different pharmaceutical company and rate of different drugs are 1.5 1.8 2.0 2.5 3.0 9.0. Which measure of central tendency will be used= Weighted mean
- Mean is= Sum of all values divided by total
- Confidence interval represents= Mean and its Standard Error
- The basic measure of Central tendency= Median
- Bimodal presentation=Mode is used as central tendency
- Mode is= The most common/ repeated value in data
- Mean in large sample=Represent normal distribution
- Middle value in upper and lower limit is called=Median
- Most repeated value in statistical data is known as=Mode
- Regarding Mean= Is calculated by totaling the values of all observations and dividing by total number of observations

607. EARLY DIAGNOSIS AND TREATMENT= SECONDARY PREVENTION

NOTE THE DIFFERENCE

Primary prevention	Includes preventive measures to ↓ the incidence of disease in unaffected individuals
Secondary prevention	Focuses on identifying the disease early, when it is asymptomatic or mild, and implementing measures that can halt or slow disease progression. Includes screening tests that are designed to identify subclinical disease.
Tertiary prevention	Includes measures that ↓ morbidity or mortality resulting from the presence of disease

NOW LET'S PRACTICE SOME PAST PAPER MCQ'S

- Early diagnosis and prompt treatment are= Secondary prevention
- Prevention in the disease process before occurrence of disease is= Primary
- Pap smear is an example of = secondary prevention
- Prevention in taking Pap smear of ladies above age 30 is considered as=Secondary prevention
- Vitamin A given to children of a selected population. This method of prevention is known as= Specific Protection.

ALSO, REMEMBER THESE

- Prevention of iron from bacteria in saliva is by= Lactoferrin
- For prevention of tetanus, what should be given= Tetanus toxoid
- A 59-year female with strong family history of IHD and breast cancer has come to you for advice regarding osteoporosis prevention. She is concerned after knowing that her old class mate suffered fracture neck of femur after a trivial trauma. The treatment of choice for her will be=Raloxifen (SERM)

608. MCQs THAT CANNOT BE COMPILED IN POINTS

PAST PAPER MCQ's

- The situation when arterial PO2 is closest to 100 mmHg will be = A person who has a left-to-right cardiac shunt
- The normal single respiratory cycle comprises = 2 seconds inspiration and 3 seconds expiration
- Two thirds of the increase in thoracic capacity in respiratory movements is the result of = Diaphragmatic movement
- At rest, pulmonary blood flow per minute in liters is = 5
- A woman had MI, 48 hours later she collapsed. ECG shows irregular low voltage waves. The pathophysiology behind it is = Re-entry current
- Aneurysm of the lower esophagus most likely involves which part of the heart = Left atrium
- An aneurysm of the third part of the subclavian artery would appear as swelling in the = Posterior triangle
- Red infarcts are encountered due to arterial blockage in = Tissue with a double circulation
- Hyaline cartilage = Is a precursor of intracartilaginous ossification
- The movements of "inversion and eversion" take place at the = Subtalar joint
- The most common feature concerning the kidneys and associated structures is = The left renal vein runs anterior to both the aorta and the left renal artery
- Regarding the large intestine = The ascending colon has a mesentery in 20% of adults
- A medical student is examining a slide under the microscope but is unable to differentiate the gallbladder from the colon. The point which will help him differentiate the gallbladder histologically = No submucosa in gall bladder wall
- Gut-brain stimulation for the myenteric plexus is promoted by = Acetylcholine
- When used together, carbidopa modifies the levodopa actions in Parkinsonism by = Decreasing its peripheral inactivation
- The hypoglycemic action of sulfonylureas is increased by = Phenylbutazone
- Primary prevention trials for the treatment of hypercholesterolemia reveal a reduction in cause mortality following treatment with which one of the following = Statins
- Dobutamine primarily affects = Beta one and beta two receptors
- Barbiturates most likely = Tend to induce liver enzymes

- The antimetabolite which can be used for non-neoplastic diseases and is also an immunosuppressant is = Methotrexate
- Azathioprine = Blocks both cellular and serologic immune mechanisms
- The drug which has shown the greatest efficiency in the treatment of obsessive-compulsive disorder is = Clomipramine
- All of the following statements about the lincosamides are accurate EXCEPT = Lincomycin is effective in the treatment of infections caused by B fragilis
- With regard to antibiotics = Metronidazole crosses the blood-brain barrier readily
- A 35-year male whilst mountain trekking over a height of 3000m develops headache, dizziness, and nausea. The drug of choice for him is = Acetazolamide
- A 65-year-old patient presented with episodes of sharp shooting pain centered around the chin. He had been placed by his physician on tablet Tegretol 200 mg TDS, but with little relief. On examination, he was found to have cutaneous eruptions in the distribution of the nerve. The primary cause of pain most likely is = Herpes zoster
- The ventral corticospinal tract diminishes as it descends and usually disappears at the level of = Mid thoracic spinal cord
- Medial lemniscus is formed by the decussation of = Internal arcuate fibers
- Adenoma is the term applied to a benign epithelial neoplasm = Producing glandular pattern
- The tumor most commonly present in the left atrium that may mimic an organizing thrombus clinically and histologically is = Myxoma
- The marker(s) present on B cells that could be used to specifically identify such cells in a flow cytometric analyzer is = CD19 and CD20
- The enzyme that brings about the joining of two or more molecules together is = Synthetase
- The structure which is made of cells that contain soft keratin, but no nuclei is = Stratum corneum
- Drainage of urine from the umbilicus of the neonate is due to a urachal fistula. This condition results from Persistent allantois
- Major store of body magnesium is = Bone
- The virulence of bacteria is related to = The production of toxins
- A normal and healthy individual is = One who has never been ill, does not take any medicines, and all his laboratory and radiological tests are negative
- The least likely factor to be associated with delayed repair after acute inflammation would be = Advanced age
- Burr cells are seen in = Uremia
- Endocrinology and Metabolism
- Long-acting insulin is = Insulin Detemir
- A 60-year-old patient with increased hematocrit and creatinine, diagnosis = Renal cell carcinoma
- Anti-diabetic which can cause sneezing = Sitagliptin
- Week-to-week body weight is regulated by = Workout
- Bilateral complete loss of all sensations below lesion has occurred, where is the lesion = Complete cord transection

- A herniated disc that causes sensory changes in a specific dermatome is pressing on = A spinal nerve or a posterior root
- From which area of the brain do the majority of cerebral cortex cholinergic fibers originate? = Nucleus basalis of Meynert
- Climbing fibers to the Purkinje cells originate from = Inferior olive nucleus
- Olfactory bulb contains which type of neuron? = Bipolar
- Immunology and Infectious Diseases
- Donovan bodies are seen in = Granuloma Inguinale
- A child presents to OPD with diplopia, bilateral ptosis of the eye, and muscle weakness. X-ray shows an enlarged structure in the anterior mediastinum = Antibodies against acetylcholine receptor (Anti-AChR Antibody)
- Which cell type increases in acute cellular rejection? = Lymphocytes
- A 35-year-old female having malar rash and positive Anti-dsDNA now develops proteinuria and hematuria. The most likely cause will be = Lupus nephritis
- The most specific test for SLE diagnosis is = Anti-dsDNA antibodies
- A 35-year-old lady having cervical lymphadenopathy is diagnosed as a case of malignant cell lymphoma. Which immunological disorder is she most likely to have? = AIDS
- Which one of the following quinolones is the best choice in treating infection of gonorrhea with Chlamydia trachomatis? = Ofloxacin
- Absolute contraindication of Propofol is = Hypersensitivity reaction
- Renal tubular excretion of penicillin can be blocked by = Probenecid
- The metabolism of theophylline is slowed by the concomitant use of = Cimetidine
- Angina may be worsened by the administration of = Theophylline
- H2 blockers are given before C-section because = Decrease volume plus acidity of gastric content
- Which drug is used in the first-line treatment of generalized tonic-clonic seizures? = Valproic acid
- Which of the following drugs is found to play a beneficial role in subarachnoid hemorrhage? = Nimodipine
- A lady heard her husband saying the neighbor loves her but does not confess, which further proves his secret love. She is preoccupied with this thought and gets confused sometimes. The lady is suffering from = Delusion
- In children admitted to pediatric wards with a disability of a permanent nature or a serious illness, the most common psychological reaction seen in parents is = Denial
- A 26-year-old healthy lady with regular cycles met a bus accident and was uninjured, but her husband and child died. In the ensuing years, her menses ceased and she had frequent nightmares about the accident. The likely cause for her amenorrhea is = Decrease dopamine
- A 5-year-old child likes to eat mud and has recently passed a worm of about 6 inches in length via the nose during a bout of vomiting. The most likely infestation is = Ascaris lumbricoides
- PCO2 at sea level is 48 percent. What will be the PO2? = 90
- 1-degree rise in temperature increases CrMo2 by = 5%
- A man cut his wrist with broken glass. Which structures are damaged passing superficial to flexor retinaculum? = Ulnar nerve and ulnar artery

- Regarding the course of the great saphenous vein, which is the most appropriate? = Runs alongside the saphenous nerve
- The virulence of bacteria is related to = The production of toxins
- A 35-year-old female having malar rash and positive Anti-dsDNA now develops proteinuria and hematuria. The most likely cause will be = Lupus nephritis
- Major energy reservoir in humans = Adipose triglycerides
- A 4-year-old boy with periorbital edema, the mechanism of edema is = Hypoalbuminemia with salt retention
- A characteristic not true of G6PD deficiency = Rarely affects males
- Butchers are at highest risk of infection from = Brucellosis
- Heterozygous allele equally prominent = Codominance
- Pap smear of a 40-year lady was done which showed mild Dyskaryosis and white patch The lesion is described as = CIN 1
- If nystagmus is a prominent symptom of a cerebellar lesion then the lesion is within = The Flocculonodular lobe
- Which cells are collectively called Iggo Dome receptors = Merkel disc
- Houston's valve is present in = Rectum
- Which method is most helpful in identifying chromosomal abnormalities = Karyotyping
- Ischemia Corpus striatum is most likely to injured = Caudate nucleus + putamen
- Hypoplasia caused by localized infection or trauma = Turner tooth
- More chances of suicidal attempt are seen in = Depression
- DOC for Psychosis in pregnancy = Clozapine
- Lines of Zahn are seen in = Coralline thrombus
- Considering organization and general plan of body human body is divided into two cavities Ventral cavity and Dorsal cavity The Dorsal cavity includes = Cranial cavity
- Of 20 women with neonates who caught tetanus 19 hadn't taken tetanus toxoid 40 women with neonates who didn't catch tetanus 30 had taken tetanus toxoid What will be the odds ratio = 9
- In a neonate of 5kg weight estimated blood volume will be = 425
- What is the characteristic feature of treponema pallidum = Causes yaws
- Porphyria Cutanea Tarda enzyme defect = Uroporphyrinogen decarboxylase
- In shock cells switch to anaerobic glycolysis due to = Oxygen deficit
- Optic groove appears on forebrain on day = 22
- Fat pad of upper eyelid is anterior to = Levator aponeurosis
- Which of the following is most likely to be the first visible gross evidence for the formation of an atheroma = Fatty streak
- Which of the chromosome is related to the location of BRCA-1 = Chromosome 17
- A 40-year male with Down syndrome has increased risk of = Alzheimer
- Mental foramen located at the level of = 2nd premolar

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